NARRATIVE

OF A

VOYAGE ROUND THE WORLD,

PERFORMED IN

HER MAJESTY'S SHIP SULPHUR,

DURING THE YEARS 1836–1842.

INCLUDING DETAILS OF THE

NAVAL OPERATIONS IN CHINA,

FROM DEC. 1840, TO NOV. 1841.

Published under the Authority of the Lords Commissioners of the Admiralty.

BY

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CHAPTER I.

Anchor in Matavai Bay—Shift to Papeete—"Jim" the pilot—Chiefs Itoti and Paofai—Visit queen Pomare—Her husband—Legal discussions—King-consort impeached—Reconciliation—Native dances—Cruelty of king—Quit Tahiti—Noon-tide disproved—Touch at Huaheine—Visit Raratonga—Mr. Buzacott the missionary—The chiefs—Market regulations—Diseases—Quit Raratonga.

VOYAGE

ROUND THE WORLD.

CHAPTER I.

Having so lately quitted the American continent, and particularly Nuhuhiva, the scenery of Tahiti did not so much interest us, as the assistance we looked for in refitting, added to the rest and amusement after our late fatigues.

I landed on Point Venus, perhaps with feelings totally incomprehensible to any on board. Fourteen years before, on the very spot where Cook was encamped, I had bivouacked for several days. I was then a lieutenant, now a captain; and I looked forward to my labours, which were there to be resumed, with an anxiety only to be experienced by those charged with similar duties. The question as to the increase of the Dolphin shoal since 1826 was my hobby. Next came the determination by actual experiment of the tidal question; Kotzebue and

Beechey having asserted a noon high water. Magnetic data were looked to with anxiety; and I was now to enter the field where so many talented men had preceded me. Furnished with well-tested instruments, perseverance alone was required. In addition to these considerations, I expected to meet with those who had befriended me in 1826, and I hoped possibly to be of service to their country.

Having obtained the necessary data for securing the meridian distance, we moved, on the morning of the 5th, through Toanoa channel to Papeete.

This channel in the Blossom's day was deemed impassable, but is now the common entrance, the French frigate, l'Artemise, having entered by it.

On entering the reefs, the boats of thirteen American whale ships came to our assistance, and, aided by a light air, we were taken through in good style by our pilot "Jim," of notoriety in Beechey's work. As a native pilot, he deserves great credit, and acquits himself with far more coolness and decision than many Europeans. At twenty minutes past eight we dropped anchor in Papeete Bay, followed shortly by the Starling.

Before entering the narrows, the chiefs, Paofai, Itoti, and the husband of the queen's mother, paid me a visit. I was much surprised at their loss of caste. In former times they were the essence of propriety; now they were reduced to compete with the other natives for the washing of linen, even in their fancy uniforms.

The consul, Mr. Pritchard, immediately paid me a visit, and we proceeded together, about noon, to visit queen Pomare, then residing at her country establishment, at Papawa. She has been married within the last six years to a young chief at Huaheine, by whom she has two sons who are living, the eldest about three years old.

I expected, as an old acquaintance, to have met with a cordial reception, but I subsequently learned that she had been so much harassed by threats of vengeance from various nations, that she hardly knew whether I had not come to make some new demand for satisfaction. However, this soon wore away upon the explanation of Mr. Pritchard, and she readily assented to my making use of the small island, Motu-utu, to land our stores, &c. during the operations of caulking and replacing some copper. Her apprehensions removed, she immediately moved down to her new house at Papeete. Her husband, of whom, however, she is very fond, is a great scamp, and is causing much trouble in the island.

Owing to the caulking and other disagreeables on board, I took up my abode at the house of the queen's aunt, where I erected my observatory, and superintended the building of a new boat. Unfortunately, there were several whalers in port, refitting, and it was not until the sixth day after our arrival that we could obtain any aid from artificers, our own being nearly useless or sick. Those who eventually came, performed about half as much as we were accustomed to in civilized countries.

Representation having been made to me that there were several cases where British subjects had opposed the verdict of Tahitan juries, and the queen and chiefs having solicited my advice thereon, a public meeting of the chiefs was convened.

Upon the questions which were brought forward for my consideration, I had only direct answers to give, confirming the sentences in accordance with their laws, and expressing my surprise that they should have hesitated in carrying them vigorously into execution, when they had the assurance of the British consul that his government would not countenance any opposition to them. Some discussion, however, threatened to arise, in consequence of their putting "*home questions*," which bore severely on the conduct of foreigners present. But these I avoided, by answering as for British subjects only, or the British consul,—promising any private advice they might wish at a future occasion.

Upon one decision against a British subject, viz., that of a young man who had forcibly retained the wife of a native, I was applied to by the defendant for redress, inasmuch as he had acted under the authority of the queen's husband, who had given the woman a paper desiring her to go and live with this young man, and say "that he told her to do so." As this was a manifest usurpation of authority, and the parties had thus been led into error and fined for it, I enclosed the documents to the queen and chiefs, requiring them to look into the matter, and

adding that as they had talked so much about their laws being disregarded by foreigners, it was incumbent on them to see that they were not brought into contempt, by being tampered with by one of their own body.

The affair was taken up with spirit. The queen (although not without a struggle) gave up her husband to the law, and issued a summons to the seven supreme judges. When they had assembled, the young king-consort refused to appear, and after much noise and excitement, the conference was put off until it could be more solemnly conducted, by summoning all the chiefs of Eimeo, as well as those of Tahiti.

Upon their assembling, the king again refused to appear, backed by the lowest order of foreigners living on the beach, who were interested in setting the laws at defiance. At length the queen, to prove her sincerity, and that she would not screen him, requested that the judges would adjourn to the palace, and try him there. This was accordingly done.

On my passage thither, I had an opportunity of witnessing some of the manœuvres which were attempted in order to foil the trial. Indeed, some of the braggadocios talked largely of going in a body to protest against the proceedings. They were the beach rabble before alluded to. They had not the courage to appear, and the judges proceeded to select a jury. They were about to proceed to trial; the king having submitted, and appeared. As I per-

ceived this would afford a good opportunity for the judges to give him a lecture, which opportunity might be lost after the trial, I expressed myself (as far as I was concerned) "satisfied that he had at length seen his error, and submitted to the laws of his country, and that I merely wished the judges to point out to him, in the presence of the queen, chiefs, and people, his total inability to interfere with the government: that he was merely the queen's husband, and by the laws of the island was not even entitled to the authority of a chief.

This had an almost electric effect. Taatee and Utamme, the two oldest chiefs, immediately stepped forth, and in the most energetic language, told him his faults, and finally exhorted him to stay more at home, and look to the interests of the queen and their children.

The several chiefs who had *secretly* opposed me, and supported the ultras, now stepped forth, and were lavish of "soft sawder." In fact, the tables were entirely turned.

To conclude the matter, I immediately offered the king and queen my hand, and invited them, together with Taatee and Utamme, to dinner on board, where they enjoyed themselves rationally and happily, and were entertained by fireworks from the island. Much to the chagrin of the disaffected, they were for this night entirely cut off from their society and machinations.

Having put upon paper answers to several ques-

tions, relating to the proper course to be pursued against turbulent foreigners, and pointed out how far they would be listened to by foreign powers when complaining of their subjects, I left them in peace and harmony, and moved the ship to Point Venus, in order to complete our magnetic observations.

Shortly after our arrival the king joined us, and seemed determined to separate himself from his former acquaintance. In the evening, a *hula-hula*, or native dance, was performed before us, by fifty young men and boys, dressed *à la militaire*, in blue, with white trimmings. The day following the queen arrived, and a similar exhibition of ladies and gentlemen took place, the former all in white, with very neat straw bonnets.

Both parties went through the performance of the *hula-hula* with great spirit; but the dresses were rather inconvenient to both sexes. One young lady, with shoes and white stockings, finding them inconvenient, first threw away the shoes, and shortly after the stockings followed.

The *hula-hula* of the present day is entirely free from objection. It is merely a display of extraordinary activity, the acmé of which is an instantaneous and simultaneous stop when at the highest pitch of exertion. It is what might be termed a romping dance.

After all this gaiety, I was much surprised, on the day following, by a visit from the consul, who, to my astonishment, informed me that he was the bearer of

a message from the queen, intreating my stay until the May meeting, (on the Wednesday following,) as the king, in a fit of intoxication, had treated the queen in a most brutal manner, in the high road; having attempted to kill her with a stone. Being foiled by her female retinue, and two young men who were passing, he had seized her by her hair, and had it not been for those about, doubtless would have destroyed her. The queen fled to the house of a cooper, where she was concealed. It appears that he had fallen from his horse in a fit of intoxication, and she had rushed to his assistance with all the warmth of affection, which was thus repaid. On his return to the house, he destroyed all her presents of dresses, bonnets, ornaments, &c., and attempted to fire the house. It was the professed intention of the queen "to move for a divorce, and that he be returned to Huaheine."

The consul immediately took the queen under his protection, and having requested my interference, I assured her that four days' delay was important to me, but if she would *assure me* of her determination to rid herself of such a dangerous and detestable character, and immediately summon the judges, I would not only wait, but also convey him to his island (Huaheine.)

To my utter astonishment, the consul informed me the day following, that she had forgiven him, and returned, thanking me in the warmest terms for my attention.

Poor woman! I am afraid this is but a beginning of such scenes. Two most unprincipled chiefs, Hétoti and Poafai, are well known to bear her mortal hatred, and if they can excite the husband to do their will, she will probably fall, and *he* will then inevitably become their victim.

Pomare is now growing old for a Tahitan, being above twenty-eight, and very corpulent. She appears to be very fond of her children, and to feel much for her unprincipled husband, although for months they scarcely speak. Her forgiveness on this late occasion speaks volumes for her kindness of heart. She is at times, however, violent and passionate, as I have noticed in her arguments with the consul. She does not possess one single trace of the pretty little girl I recollect as Aimatta in 1826.

I had frequent opportunities of seeing her in the midst of her retinue at Papeete, as she occasionally stopped to take tea at my quarters. One division were admitted to table; the second division sitting in the verandah. On these occasions her manners were very pleasing, and care appeared to be banished. I endeavoured to entice the husband to join us, but without success.

With respect to the present condition of the Tahitans, it is my decided opinion, that with the introduction of dress, the peculiar religious feeling which I noticed in 1826 has vanished. They were then simple in the extreme; they are now comparatively civilized. The introduction of foreigners has

broken down the legal barrier which restrained them. I much regretted that I could not be present at their May meeting. It is similar to our parliament, and our presence might have assisted in the introduction of laws for the comfort of the well-disposed. I had no object in view; but the chiefs of all parties, as well as the missionaries, wished my presence.

On the evening of the 8th, we quitted Matavai Bay, and shaped our course for Huaheine, in the hope of finding an anchor said to have been left there.

The course of tidal experiments at Papeete, as well as Point Venus, negative the noon high-water.

Dolphin shoal has not increased since 1826, nor had it at that date altered from the account given by Wallis or Cook. On the other hand, two coral patches, discovered by me in the Blossom's visit, have *decreased*, and are now hardly to be found. The new channel into Papeete exhibits a clearing away of coralline obstructions, and the formation of a deep channel. The Blossom could barely enter Toanoa; *now*, a line of battle ship *can enter easily*. The spot where the consul's house then stood is no more: *vessels may ride there*. Surely here is no evidence of the astonishing activity of lithophytes.

Hardly had we cleared Point Venus, when, for the first time during our visit, it rained heavily, and did not clear up until after midnight, when we cleared the island of Eimeo. Shortly before sunset on the day following we rounded the point of Huaheine, and would probably have anchored had the wind favoured

our entry. However, as we were taken aback at the entrance, I decided on going in my boat to view the anchor, and ascertain if it was worth delay.

Having given a passage to Mr. Barff, jun., (the missionary at Papeete,) to visit his father, the resident missionary at Huaheine, I took him with me, to show where the anchor lay. One glance was sufficient; it was entirely useless. I therefore proceeded on with him to his father's, where an hour or two flew away rapidly, in the presence of the fairest display of beauty we had seen in these seas. Having partaken of tea, and the hospitalities and attentions of this worthy family, and discussed the budget of Tahitan intelligence, I took leave of this interesting group, (nine children, ranging from ten to twenty,) and by moonlight soon regained my ship, and bore away for Raratonga.

The natural beauties of the island we saw little of, although, from the luxuriance of the trees noticed near the beach, and the peculiar formation of the island, I have little doubt that it would have repaid our delay. By the description of Mr. Barff, it contains an interior pool, with two passages, one of which is navigable—apparently an old crater. It is, in fact, a double island. It is considered one of the most interesting islands in the Society Group. The mountain scenery is more picturesque, the soil on the lowland more fertile, the population better disposed and better featured, and more easily ruled.

The island itself affords more scope for investiga-

tion, by sea as well as by land, and it is very probable that in the course of time its excellent harbour may rise into importance. This island was a great favourite with Cook. Had it been six hundred miles west of Tahiti it certainly would have attracted my attention; but time was of too much importance to wait here, every hour in chronometric measurements being of importance.

Just after noon on the 13th, (having the night previous experienced a most extraordinary head sea, with the wind hauling to the S.E.) we observed the island of Mauki, through the rain clouds which hung upon the horizon, exactly on the bearing which, by our common reckoning, we had anticipated. In Arrowsmith's chart, the island is termed Parry's Island, as laid down by Lord Byron, 1825, as well as Miuta. The whole of the Harvey Group were however, well known before 1825, as will be seen by the work of the late Mr. Williams, who claims also the discovery of Raratonga, but which is designated on the chart as Orurute, "discovered by Captain Henry." However, it is well known by the native account, that they had long before been visited frequently by whalers, and Captain Henry did not touch at it until after Mr. Williams resided there.

The island of Mauki is about two miles in diameter, well wooded, and inhabited, but the soil does not appear in any part to exceed forty feet above the sea evel. It is situated in latitude 20° 7′ S., and longitude 157° 11′ W.

About four P. M., we lost sight of Mauki, and, favoured by a strong breeze from S.E., made the island of Raratonga at eight on the following morning. Heavy rain clouds frequently obscured the island, so that its lofty and picturesque peaks were shut out from us until we had neared within three miles. Three American whalers were cruising off, waiting for supplies; but nothing was at anchor, to guide us to the landing. Following up one of the whale-boats, we tacked close in to the reefs, and went on shore in my gig about ten: the showers fortunately admitting of our saving the forenoon sights between them, as well as the latitude at noon.

Having letters to Mr. Buzacott, the principal missionary, he soon made his appearance, and conducted us to his house, which for neatness and comfort surpasses anything we have met amongst the missionaries. The roads, enclosures, church, school, and private residences, are an age in advance of Tahiti. Neatness and regularity prevail, and the appearance of the resident chief, as well as of those about him, reflects the highest credit on the present missionary, as well as the unfortunate originator of the present system, the late Mr. Williams, who was recently murdered at Mallicolo. It reminds me of what I expected of Tahiti if their laws had been enforced.

The residence of Mr. Buzacott is situated about one eighth of a mile from the sea, and about half that distance from the main road; which is perfectly level, and of the ordinary width of those in England,

the walls of the enclosures in the town (constructed of coral and mortar) confining it. The road to his house leads through the churchyard, when an artificial raised road on coral blocks, carries you through a cocoa-nut vista by a gentle rise to the house, which is reached by a flight of steps composed of block coral, about twenty feet ascent, the house occupying a level terrace cut away from a rather steep hill.

With all the difficulties incident to missionary progress, one is not a little surprised to meet, not only with the conveniences, but also the comforts, of a well-furnished house. These are principally native, but the result of missionary instructions; care having been taken to teach them useful arts. They manufacture tables, chairs, and sofas, with cane bottoms, fit for any of the middling classes in England. These form an article of export to Tahiti, and a pair of their arm-chairs grace my cabin. The wood of the Tamanu, from which they are manufactured, may vie with Honduras mahogany in beauty, and is far superior in durability.

Four very neat stone cottages were just completed, having two good rooms each; these are intended for the students in the college about to be built where Mr. Buzacott's house now stands. In the present school-room, where they have also a printing press, I was shown the production of one of the native scholars, being a manuscript copy of the New Testament, in progress, the writing clear and intelligible,

the scholar a native missionary, probably to be forwarded to some island where Christianity is unknown.

The church is an extensive wood and plaster building, capable of accommodating about one thousand persons ; it occupies one side of the road, and the native school the opposite.

The house of the principal chief, Makea, (or perhaps more properly the king,) is well built, of two stories, and fit for any European. It was built by the father of the present chief, whose likeness is given in Mr. Williams's work. He has also a very neat little cottage within the same inclosure, where he probably lived during the lifetime of his father. Between the two stands very conspicuously the tomb of old Makea, very neatly kept and whitewashed.

A covered building, or extensive shed, near the landing-place, is used as a market-place. There I found the chief tidily dressed in European costume,—cotton shirt, white trousers, and white frock coat,—superintending the purchases for the captains of the whalers. All this results from a change from absolute barbarism and heathenism since 1825.

About sunset all were in motion towards the church, the women mostly in native tapas, with straw bonnets ; but there was no unseemly noises or behaviour, as at Tahiti. The chief himself, although engaged in conversation with me at the time, followed the stream.

It is pleasing to witness the influence Mr. Buza-

cott has acquired; not the servile fear of the Sandwich Islanders, but an honest, warm-hearted attachment. He is a pattern for missionaries. Such men by their labours improve all around them. They prove their superiority by their ability to instruct others, and they leave behind them lasting monuments of their utility, in the increased civilization and happiness of the people.

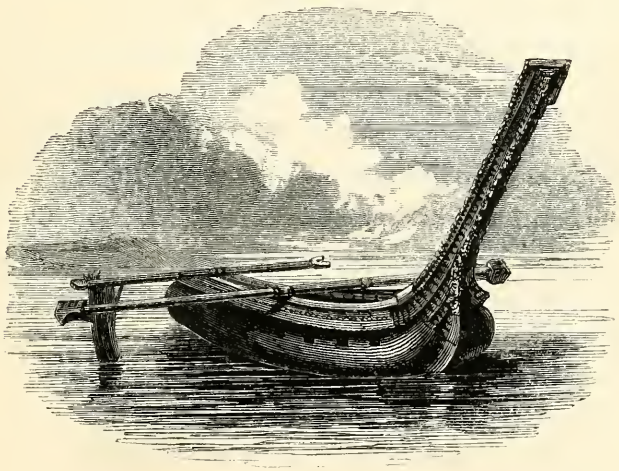
From constant association in their labours they acquire a desire to progress, and I have little doubt that this island will hereafter produce valuable results on many others. They have now three missionary stations, but I fear they have not three Buzacotts. This excellent person's history is told by Mr. Williams, in his account of this island.

It is to be hoped that this island may be spared the introduction of foreign settlers as at Tahiti and Oahu; for when that commences, adieu to peace and prosperity! I used my best efforts to alarm the chief, as well as Mr. Buzacott, in order to induce them to watch this point jealously; and I trust with effect. A very judicious code of port regulations is printed, and a copy furnished to every vessel on arrival; non-compliance excludes communication. Deserters find no refuge. Spirits are prohibited; and order at night is insured by preventing any foreigner remaining on shore after dark.

The produce of the island is similar to that of Tahiti; but poultry, particularly large turkeys, vegetables, &c., are finer and cheaper, and are readily

obtained by application to the chief, who controls the market and prevents any undue demands. The mountains, constantly fed by the clouds, afford numerous streams; one enters the sea at the landing-place, which, although apparently open to the sea, and edged by reefs on either hand, seldom throws in a ripple to hurt a boat, excepting in the bad season or S.W. monsoon, when the breeze blows in.

The island is infested by myriads of the mantis, which completely strip the cocoa-nut trees of their leaves, and eventually destroy the tree. The tamanu attains a great size; one tree I noticed near Mr. Buzacott's house, divided into two stems, but the bulk at the root would give the entire twelve feet



diameter. Their state canoes are made from this tree, and are very beautifully carved. At the island

of Mangea, belonging to this group, they are famed for their carving, particularly in fancy axe-handles, resembling in some degree the Roman fasces; several of which, as well as mats and tapas of native workmanship, and other curiosities, were obtained here.

By perseverance between the showers, we succeeded in obtaining our suite of observations, by which we find that this island is placed on the charts about fifteen miles too far west, and two south, of its actual position.

As the ship could not find any safe anchorage, and Vavao had been selected as a rating position, delay was out of the question; therefore, taking leave of our kind friends, about four P. M. on the 15th, we took our departure with much regret.

The natives are generally well-built, but of a coarser habit than our Tahitan friends. It appears that in addition to the immense mortality which occurred in the time of Mr. Williams, a new nondescript disease has of late years presented itself amongst them, and is entirely confined to the native population. On its early presentation, the first symptoms, merely swelling of the glands of the throat, were considered certain monitors of speedy death, attended with great torture; but latterly it has yielded to treatment. It is thus described by Mr. Hinds, our surgeon, who examined a case said to present a complete type of the disorder.

"The accession is accompanied by the usual

symptoms of fever,—rigors, followed by heat, dryness of skin, and some headache. This either entirely disappears, or assumes an intermitting form, but in both is followed by an affection of the glands of the neck, groin, or axilla, and sometimes by tumours in the small of the back. An enlargement commences, due to chronic inflammation, which gradually increases, until the tumour attains a large size, impeding the functions of the neighbouring parts. In the case I witnessed, the glans of the neck were affected on the right side, and an abscess had burst, leaving a large but superficial ulcer, discharging a thin serous matter. On the opposite side large abscesses were in progress, and the back of the neck was also occupied by another in a less forward state. The patient previously had been a strong healthy man, but the disease had deprived him of all energy, and his limbs were much emaciated. Although the disease did not extend much inwards, he experienced difficulty in speaking, swallowing, or respiring. The progress is slow, but generally fatal. The termination is perhaps assisted by the patient's giving himself up immediately, and neglecting to pursue the remedies prescribed. The missionaries have used the liquor arsenicalis internally, and ointment of hydriodate of potass externally, with partial success. They also regard it as contagious, but this is a character which cannot be admitted except after strong proof. Hitherto no white people have been attacked, nor have I heard of its appearance elsewhere."

The swellings are immense; at first sight appearing like huge wens. In a case which I witnessed the left cheek was continued nearly to the shoulder and back of the neck; and this was in a youth who apparently gave himself little concern about it. This would go far to dispel the impression of contagion, as few would submit to his company, and yet he was always foremost amongst those who pressed round us. I took especial care, however, that he did not come in contact with any of our establishment.

I have before adverted to the customary charge of a certain set of missionaries, and more particularly those of the Sandwich Islands, that the decrease of population is to be ascribed to the intercourse with foreigners. In this island at least we have certain proof that in both visitations, (which have nearly depopulated this island,) foreign intercourse *cannot* be the cause; and I feel well assured that in the majority of cases, diseases which have baffled the scanty knowledge of pharmacy which the reporters possessed, were conveniently ascribed to suit the hypothesis they were bent on maintaining.

The question naturally arises—Do you speak from personal knowledge? Possibly not to the extent necessary to settle the point. But I do know, that on our visit in 1826 to Pitcairn's Island, we had the opportunity of learning from those who spoke pure English, "that they would suffer severely from our

visit;" that the change from vegetable to animal diet, when visited by strangers, never failed to entail sickness. (Vide Beechey, vol. i. page 94, 95.) This has been noticed by Captain Beechey, but I followed it out at Tahiti, as well as at the Sandwich Islands, and my own opinion is, that the attempt at premature change of habits, as well as clothing, will account for many varieties of disease.

It is evident that many diseases rage in positions where Europeans never set foot, and it is highly probable, that, like the two cases now before us, they originated amongst themselves. I heard at Tahiti of a pig affecting numbers. Was the pig diseased? And if so, how came it so? Had a party existed as intent on tracing the true sources of disease, as others are in croaking about what they are utterly ignorant of, probably a very different tale would be told. But *if the fact be*, as urged by these upholders of American and European contamination, (at the Sandwich Islands,) why do they not exert themselves to erect a hospital, by which means the remedy might be offered? Have any of them moved such a question? Do they ever visit the sick or attempt the cure of body and soul, or in any way assuage their miseries?

On the 18th, baffling winds and rain caused me to haul to the southward for the night, intending to search for an island and shoal laid down by Arrowsmith. Fortunately very strict orders were issued to the officers in charge of watches, and at four A. M.,

whilst estimating the probable distance on the chart, " breakers under the lee " were reported. We were at this time fifteen miles to the eastward of their assigned position. We tacked immediately, signalled to warn the Starling, and at daylight separated to examine both sides, and continue a parallel course due west one hundred miles, in order to determine if any second danger existed.

By our survey, it appears that this reef occupies an outline similar to that of a coral island, having an entrance to the N.W. All the mass of shoal water appeared to be contracted at its S.W. extremity, but no rocks above water could be traced. The S.W. extremity was determined to be in latitude 20° 2′ N., longitude 167° 49′ W. ; which differs from that assigned to the shoal seen by Captain Nicholson. We termed it Lagoon Reef.

Our course was then shaped for Vavao, the largest northern island of the Hapae group, but by some navigators they are included in the Tonga group.

At daylight on the 21st, we reached within ten miles of its northern point. The appearance of this cluster presented a complete archipelago, with many dangerous reefs off the southern extreme. We fully expected to reach our anchorage before nine, but after rounding the northern extremity, where by the chart we expected to find " Port Refuge," we continued to run down its western side until the openings seen from the eastward again presented

themselves. Through these openings, only, could we expect to find the port. Indeed, I had almost fancied that we had made a wrong landfall, and in order to secure the meridian distance, I immediately landed on the nearest accessible station, and succeeded in saving latitude and time; the ship working to windward during the interval.

A pilot, left by her Majesty's ship Cruizer, soon visited the ship, and having rejoined her myself, about five miles to windward, we continued to beat through a labyrinth of islands, about six miles to the N.N.E., until sunset, when we dropped our anchor in the *inner harbour*,—the first ship or vessel of war that had anchored there.

The title of Port Refuge it certainly deserves when this anchorage is obtained. Few square rigged vessels, however, would reach our position. It is very difficult of access, and it is necessary after entering the islands to turn five miles to windward against a lee set, before an anchor can conveniently be let go, and this requires daylight. To a disabled or crippled vessel seeking refuge, this name is deceitful: she never could reach it.

I merely allude at present to the outer anchorage, for nothing but small fore and aft vessels will attempt the inner harbour.

The resident missionary, Mr. Thomas, accompanied by the master of the American whale-ship Triton, immediately called, and afforded us all the information which might interest. From Mr.

Thomas we learned "that owing to internal wars in the Tonga group, arising from the rebellion of the heathen population, in opposition to Christianity, the king (George) and chiefs had gone to assist the latter." The produce of this beautiful island has been nearly destroyed by the violent hurricanes, which of late years have been frequent.

Upon the subject of this "*religious war*," in Tonga—(or better perhaps known as Tonga-taboo) and in which Mr. Thomas appears to take a strong interest, I am much inclined to believe that its origin proceeds from a *harshness in making Christians*, instead of inducing them to become so by persuasion. The punishments for offences against a *forced* religion, by a people not long converted, are dealt too unmercifully—are indeed so severe, that we were informed some of the women died under them, and that they were only induced, by the interference of one of our ships of war, to adopt milder measures.

It was openly asserted that *three and a half inch rope* has been used to inflict punishment on women!

These remarks lead me back to an observation in the Hawaiian spectator; "Remarks on the discourse by the late Rev. W. Orme, foreign lecturer of the London Missionary Society;" asserting that he drew a portrait of the South Sea Mission, for which there is no original in the Pacific.

The Sandwich Island missionaries never will see

such where they are residing; and the English mission at Tahiti had well nigh met entire discomfiture, by bordering on their absurdities. Savages are not to be broken in like wild horses. They are not to be compelled to *feel* that the religion imposed on them by the fiat of the king, is to be akin to abject slavery. Where are they to look for that peace and contentment so often preached? Is it reasonable to expect, that the millions inhabiting the islands in these seas can, from a state of the most unlimited enjoyment, be brought *by law* to believe that the Christian religion is to ameliorate their condition, when the very habits and countenances of their would-be pastors are almost *distorted by severity?*

But I remember, in our visit to Tahiti in 1826, that the natives, by *choice*, by *free good will*, made the sabbath such as I have never witnessed in the civilized Sandwich Islands. I have seen them with cheerful faces flock to church in their best. I could not purchase provision on that day. I witnessed less crime amongst them than in other countries; and on my doubting the word of a chief, he very deliberately asked me whether "I did not believe that a God above saw him, and if it could be to his interest to tell a falsehood?" The attachment also of the natives to their pastors was strikingly evinced on many occasions, and I confidently believed, from having lived constantly amongst them, and away from the neigbourhood of the ship, that prodigies had

been effected amongst that nation. But I suspect that the harshness which ensued caused them to revolt, and by that measure broke a link in the chain which it will be no easy matter to unite. I understand, however, that at the districts distant from the port of Papeete much regularity still prevails.

This is one British mission. Reports from Huaheine, and what I myself witnessed, of the benignant features of Mr. Barff, lead us to believe that happiness and content reign there.

The success of the late Mr. Williams, who was *beloved* at Raratonga, is shown by his narrative. I must add, from *personal observation*, that I was most agreeably surprised at finding the condition of the people under their esteemed friend and pastor, Mr. Buzacott, (with a good, honest, hearty John Bull countenance, to court instead of terrify,) far exceed my expectations, and I certainly think that Mr. Orme's picture must have been furnished from thence.

At Vavao, however, the missionary creed, I understand, changes, consequently the system may be more rigorous. All I can state is, that the approach of the missionary to my tent was not hailed with anything like satifaction by the natives, and that I lost many articles of curiosity, from parties being afraid to approach without his approbation.

In the morning our tents were pitched in the face of the hill on which the town is situated, and

we succeeded in obtaining most of our magnetic observations. Rain set in, preventing our obtaining the requisite astronomical observations until the day following.

We were soon surrounded by natives anxious to dispose of their wares, but the absence of the chiefs, and principal people, caused a very apparent dejection. Vegetables, fruit, cloth, (tapa,) mats, shells, and weapons, were brought for barter, but their prices, since the days of Cook, have materially increased; cotton, cloth, and knives, were the only trading articles.

Money they knew by name, but hardly understood its value; as they frequently demanded a dollar in lieu of a knife worth fourpence, and were generally content with a real, (sixpence,) in lieu. The term dollar (or tarra) is here, as at Tahiti, intended to imply coin, and the immediate offer of the real, one eighth its value, was frequently taken with avidity.

The manners of the natives appeared to be several shades superior to those of any of the islands we had visited, evidently resulting from a more determined character, and a reflective turn; probably much assisted by their stricter adherence to Christianity, which at this particular moment of religious warfare, they feel it necessary to maintain with closer observance. At dawn and dark the voice of prayer and singing may be heard from each house throughout the settlement, and on Sunday

the full chorus of natives afforded a very fair specimen of their singing.

The church is spacious, and tastefully ornamented with native mats on the rafters, much resembling printed calico. The interior of most of the missionary and other houses, here as well as at the other islands in these seas, generally have the rafters, ten or fifteen feet upwards from the eaves, decorated in this manner.

We saw but little of their workmanship, owing to the absence of the canoes, chiefs, and warriors. The few articles obtained were inferior, excepting their household wares, consisting of mats, pillows, &c., which are very simple. The frequent visits of whale-ships have also drained the market.

A state prisoner, "*the heathen king*," as well as his family from one of the islands, was in our immediate neighbourhood. I visited them, and gave them various presents. They were much dejected, and apparently very grateful for the notice bestowed on them. A very pretty little girl, either a daughter or relative, about six or seven years old, seemed to have much influence with the natives, and interested herself very much in bartering for us, and preventing undue demands. I presented her with various trifles, particularly beads, which were useless in the market. On the day of our departure, she brought a number more of her own age, and literally commanded by her manner, that they should be similarly treated. As she was a princess, there could be no denial!

It is very strange, that although we have generally noticed beautiful children, we have seldom, if at all, seen a striking grown up beauty.

When I took leave of this unfortunate family, several little presents were secretly sent to me through the pilot. That from the king was a piece of kava root, wrapped very carefully in tapa; doubtless, a most splendid gift in his estimation, but if it had been detected in his possession, I was told that he would be severely punished.

We had no opportunity of examining the country, our arrival being on Saturday, and our departure the evening following. The trees here do not attain the size of those in higher islands, but from their being thinner, they attain a much closer texture. The Tamanu, although it does not attain a large size, is much superior in grain and beauty, to that of Tahiti or Raratonga.

The highest range of land, all of which might easily be converted into one great garden, does not at any point exceed three hundred feet. The surface is very level, and the soil fine.

The composition of the rock is a very close-grained limestone, containing large caverns, in which crystallized carbonate of lime, stalactites, &c., abound. Indeed, wherever the cliff is fractured a complete crystalline structure is presented, in which shells, coral, &c. are frequent. At the outer position, where I obtained observations, I found many specimens of imbedded fossil nautilus. None of the nacreous

substance remained, but was replaced by crystallized carbonate of lime. The hardness of the rock, added to its broad flat surface, prevented me from obtaining more than a single specimen.

At the sea level the water has worn away the outlines so much, that all the cliffs overhang the islands, presenting a mushroom form. The caving runs about ten to fifteen feet horizontally, by five or six vertically; consequently, where the sea has much play, and the coast is exposed, landing is impracticable. In some cases the overhanging mass has fallen away, and landing is facilitated; but the depths alongside these islands increase suddenly to forty fathoms or more.

The supplies to be obtained at this island chiefly consist of yams, which were said to be the finest in these seas. The hurricanes have injured or destroyed the greater part of the fruit-trees, otherwise shaddocks and cocoa-nuts would be plentiful. I noticed but one indifferent shaddock, a few pines, cabbages, onions, and yams. But our arrival was hardly known in time, and Saturday is so completely devoted to cooking for the next day, that little was produced.

Here again we met with the iron hand of the missionaries, for they rule the king, chiefs, and people. The system throughout these islands, of prohibiting even the necessary ablutions on the sabbath, is a stretch of feeling far beyond good sense. A certain hour might be established by law, at which necessary labours should cease.

Fish is either scarce, or other occupations prevent the people from seeking it. The great depth of water also around these islands is another drawback. Were it not for this cause, this groupe would afford some of the finest harbours in the world. But, excepting the inner harbour, I should not consider my ship pleasantly berthed, the depths decreasing suddenly from ten, sixteen and twenty-five to forty-five fathoms. Our stay was too short to admit of any survey being made.

At three on the 23rd of May, we took our departure from Vavao, and had barely cleared the entrance when the breeze chopped round to S.S.W., preventing our making much headway.

Final observations for rating were obtained at our first station, as well as the true bearing of the Peak of the island of Latte, which we were eventually enabled to fix, from a sea position, the day following. I am informed that very dangerous breakers extend a considerable distance from its western extremity.

The positions fixed by us were, first, the outer white-faced point on the left side of entrance, which can readily be known by being the nearest to Nine-pin Island. It is situated in latitude 18° 38′ N., longitude 174° 3′ W. The second position at the town is in the King's Old Garden, latitude 18° 39′ N., longitude 173° 55′ W., variation 9° 34, dip 35° 7′. The island of Vavao is placed about sixteen miles too far to the southward, on Arrowsmith's charts.

CHAPTER II.

Visit the Feejees—Ships trikes—Rudder damaged—Reach anchorage—Visit of Missionary—Starling despatched to Tibooka—Measures adopted with the natives—Town of Rewa—Fighting bourri canoes—Phillips and chief of Rewa — Kindness of Commodore Wilkes — Rivers of Am-ba-ou — Implements of war—Captured chief—Mode of dressing hair—Leekee worn by women — Discussion relative to missionaries and their adoption of Christian Religion—Invasion of Banga—Cannibalism— Garingaria — Reach Port Resolution — Unpleasant position of missionaries from navigators—Natives troublesome —Awkward predicament—Habits and dress of natives—Quit Tanna.

CHAPTER II.

Light breezes from S.W. to S.S.E. prevented our making much progress. On the 26th, we made the easternmost of the Feejee Groupe, about forty miles to the northward of Turtle Island, and passing through between the islands, were soon favoured with a fair wind.

Previous to quitting Tahiti, we had been fortunate in obtaining information respecting this group, and particularly of several new islands not laid down, which are excellent guides to what is deemed the best harbour, Nukulau, on the southern side of Ambou.

At noon, on the 27th, we passed the island of Matoke, and shaping a course for Ambou, found ourselves, about two A.M., quite close enough to the breakers, tacking within sight and hearing of them. We had, not a moment before, had our attention excited by lights, probably fishermen on the reefs, otherwise our position might have been hazardous. The

lights were instantly withdrawn, upon our showing lights at our foreyardarm.

At daylight the current had set us considerably to the westward, and just as we bore up for the anchorage, the breeze headed us off. As this was followed by calm, I immediately started in my gig, to save time, as well as examine the anchorage, &c., leaving the sketch of the entrance with the commanding officer. We reached the island of Nukulau, about half-past ten, and were visited by a few fishermen, and, at noon, by seven double (sailing) canoes, having about ten to twenty persons in each. One who termed himself "a small *thief*," (chief,) understood a few words of English, and acquainted us that they were bound to Cantab, or Mywoollah on the charts, which are nearly useless.

About two the ship entered by the eastern channel, and one of the natives immediately volunteered his services to conduct her through the shoals. I had already my misgivings about that channel, although stated to be "quite free from danger," and whilst anxiously watching her progress, as well as that of the boat with the pilot, had the mortification to see her take the ground.

In a very few moments the ensign, union reversed, informed me that the accident was serious, and called for my immediate presence. No time was lost in packing up our instruments, and proceeding to her. On reaching her, I found that she was afloat, but had her rudder off, and had broken the pintles.

"Misfortunes never come single." Having anchored and secured the rudder, we commenced warping, occasionally assisting her by the fore and aft sails, when she suddenly went from ten into two fathoms, with her stem between two rocks. The tide left her, and having steadied her by the stream-anchor in still water, we patiently awaited the turn of tide, when we warped her forward to her anchorage, discovering several other patches in our route. In the midst of distress we were visited by Mr. Cargill, one of the resident missionaries, whose wife, then dangerously ill, required medical assistance.

From him we ascertained that the American surveying squadron were still at this group, the Peacock having quitted the port but a few days since; the Vincennes was supposed to be at Tacanoa, or Obalau, where they were all to rendezvous. One of the king's brothers having taken an active part in an attack, or retaliation upon an American vessel, by which the mate and several of the crew lost their lives, opportunity was taken, when the king, queen, and chiefs were guests, to detain them as prisoners until this man was delivered up. Sooner than lose their king, his brother, Tho-ka-nau-to, or Phillips, volunteered to produce him. On his appearance he was heavily ironed and taken away. It is said he will be taken to America, but what they can do to him is very problematical.

In consequence of this affair, our reception was anything but flattering. Neither the king, his

brothers, or the chiefs, would venture within our power for some days. This partly vanished, when it became known that it was a British vessel of war. The king, however, refused to come until I had paid him a visit, which my duties prevented for some days.

On the second day after our arrival, Mrs. Cargill died, and as my duties rendered my absence impossible, the senior lieutenant, attended by all the officers who could be spared, was sent to attend the funeral.

As there was a probability that one of the American ships could spare us rudder pintles, the Starling was immediately despatched to make the necessary application; on which occasion, Phillips, (the king's brother,) who speaks English well, volunteered to pilot the schooner to Libooka, where the Peacock was supposed to be at anchor.

In the meantime the rudder was hoisted in, and preparations made for securing it, in the event of her mission proving unsuccessful.

Measures were taken to complete the survey of this port; and the tents, &c., were pitched on the island of Nukulau, for obtaining the necessary suite of magnetic observations, &c. For several days we were beset by the natives, and were finally compelled to erect barrier lines, and appoint a guard to keep them at a proper distance; not from any troublesome conduct on their part, but the nature of the observations did not admit of the vibrations caused

by such numbers walking to and fro on the loose sand.

The king's brother, Garin-ga-ria, paid us a visit, in order to ascertain what he could pick up, and numerous spears, clubs, bows, arrows, and ornaments, were brought for sale ; but, as customary with these people, they were exorbitant in their demands — whale's teeth, knives, &c., being the objects sought in exchange. My object was first to secure pigs and yams for the crew, and then look for arms, curiosities, &c. Indeed, I had promised Phillips, to await his return. Some few pigs, yams, and fruit, were purchased. Vermillion was found to be an article in great demand amongst the ladies ; I therefore gave them to understand I should reserve this for shells, which they were to seek on the reefs, and with which we were soon inundated : although none of them were of any value.

The canoes bound for Cantab, unfortunately for us, put back the moment they perceived the ship at anchor, making our island their rendezvous, and rendering it a difficult matter to preserve order. However, as some of the principal chiefs accompanied Garin-ga-ria, as well as their interpreter, and "*lawyer*," I made known my wish to have the space occupied by my party tabooed.

In a few minutes the lawyer, or crown orator, made known that he was about to address them. As if by magic, every one immediately became seated, and a simultaneous signal, by clapping the hands

and a hollow nasal *whoo*, denoted that they were attentive.

The manner and gesture of the orator was energetic and admirable, but as we understood nothing that was uttered, all that we can say is, that many parts of his harangue were specially applauded, and at its termination the same *whoo* and clapping of hands ensued.

I was now informed by the interpreters, (an American black, and two or three Tahitans,) that they would observe my wishes and respect the boundaries, which we accordingly formed by stretching lead lines from post to post. It is a curious fact, observed throughout the groups from Marquesas to this island, that a native will seldom stoop to pass *under* a line; and in many cases rather than step over it, even when lying *on* the ground, they would walk entirely round the end. This was rigidly adhered to at Marquesas. I have my doubts if this line of demarcation is not offensive to them.

Notwithstanding the efforts of the crown lawyer, I found that nothing but "*vi et armis*" would preserve the boundary, and was compelled, therefore, to keep sentinels constantly on the alert. These interpreters alluded to are foreigners taken under the protection of different chiefs; they are, *de facto*, their slaves so long as they are maintained, and are even compelled to feed their masters when the custom of the country, or their being placed under Tambo (or tabu) prevents their touching their own food with their hands. I am sorry to say that Englishmen are amongst the

number. One of these, the American black, I took into my service during our stay, as interpreter, and he behaved satisfactorily.

Finding that the king was afraid to visit the ship, in consequence of my failure in visiting the town of Rewa, I determined on sacrificing a few hours and paying him a visit; as, until he was propitiated, there was no chance of obtaining the necessary supplies of hogs and vegetables. I therefore started, taking with me Lieut. Monypenny.

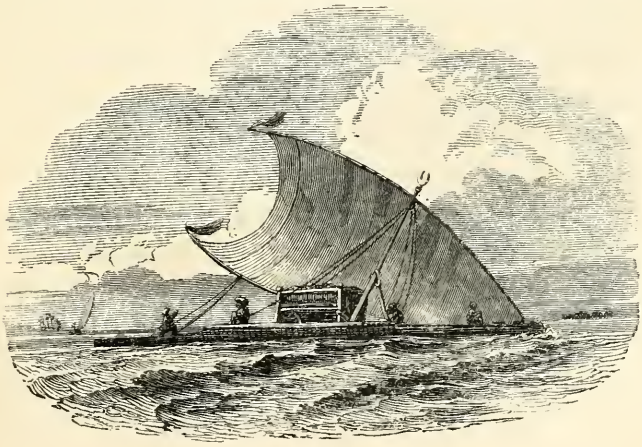
The distance to the town of Rewa from the anchorage is about six miles, and two to the mouth of the river, studded with unpleasant sand banks, over which there is about three feet at low water, and on which the capricious rollers at times suddenly bestow a ducking. After entering the river, the channel at low water becomes tortuous, and the drain generally bears out, although the main-banks are about four hundred yards asunder. The canoes are generally forced up by poles, similar to punting on the Thames.

The town of Rewa is situated about half a mile from the bank of the river, on the right bank of a creek, which shoots off abruptly from the main stream the width of the creek at that point not exceeding one hundred yards.

The houses, which overlook the creek in some places, are firmly constructed with posts, which do not rise more than seven feet from the earth. On these arise very lofty pitched roofs, varying from

twenty-five to thirty feet in height, and in some instances thatched to the thickness of *two feet.* The doors are small, excepting in the state-house, and resemble windows or ports; those in elevated mounds with *ditches* remind one strongly of block-houses. In the state-house the resemblance is rendered still closer by the presence of two ship guns, as if prepared for war; certainly not very appropriate chamber companions.

The establishment of the king is situated upon a bend of the creek, the houses of his queens occupying the water-side, and his own being in an open area, in which also is the house of his principal queen, the tomb of his father and brothers, and the "fighting Bourri," or temple. This latter is a small building about twelve feet square, erected upon a mound of about ten feet elevation. The thatched roof is very steep, probably thirty feet, across the summit of which is a pole projecting about three feet at each



end, studded with brilliant white porcellanic shells. (Ovula ovum.)

Their canoes are similar to most of those belonging to the low islands, very long and narrow, furnished with outriggers, and a convenient house on a platform. Vide wood-cut.

The house of the king (or more properly chief of Rewa, he being subordinate to the king at Obalau) is one of the most filthy in the town. Its dimensions are about sixty feet in length by thirty wide. Two thirds of it is well clothed with mats and kept clean; the remainder may be considered the cooking and eating hall, &c.

Three immense iron caldrons, probably intended for a whale-ship, together with other earthen vessels for boiling, occupy the cooking square. The king and favourite queen were seated upon a range of mats immediately contiguous to the fire, and on entering invited us to do the same. Shortly after, a roasted hog and vegetables were introduced, and we were invited to partake. As they had neither knives, forks, nor plates, I followed their motions, rather than the chiefs should take fresh offence, and our journey prove fruitless.

The carving of this hog was most adroitly performed by the "carver general," *a professor*, with a piece of slit bamboo, which by-the-bye was first cut into shape with a steel knife; therefore I suspect etiquette demands that the bamboo should be preferred. The king's barber, taster, &c, (or I suppose

"the barber royal" to be his proper style,) selects the king's portion, peels his taro, or yam, and presents it, without any humiliating forms, in a clean leaf. This person is never permitted, under penalty of instant death, to touch his own food with his hands; and he may be seen tearing his meat like a dog from the floor with his teeth, whilst it is there held by a stick. Before the king commences eating, all present clap their hands about four times. If he drinks, finishes, or sneezes, the same is repeated. The principal queen and about ten other queens were present.

As I found that friendship was established, and the king signified his intention to visit the ship on the following Monday, I gladly took my leave.

As some mischievous persons had been busy inducing the chiefs to withhold supplies to the ship, to suit their own purposes, I visited the brother of the king, Garingaria, reported to be in the list of malcontents, and most active in the pig embargo. His house I found very superior to that of the king; very large, neat, and well arranged, but nevertheless that of a perfect savage. This Garingaria is reported as the most determined cannibal of this group. He has his friends as well as enemies, and although savage, is less deceitful than those around him. I would much rather be his prisoner than that of the king or any of his immediate retinue. He distinctly denied any participation in the plot, and I instantly saw by his countenance that he

spoke the truth. He immediately sent down a present of three pigs.

The king of Rewa is a very strong-built, muscular man, standing about six feet two inches; Phillips, or Thokanauto, five feet ten inches; Garingaria probably six feet four inches. The prisoner taken away in the Peacock, said to be a very fine man, we did not see. The present king, who is considered a very weak-minded man, and despised by his brothers, succeeded his father, who, according to custom, was murdered to make room for him. It is not improbable that his death will shortly enable one of the remaining brothers to succeed him. Indeed, Phillips said in his presence, "I shall be king in four years." I found there were plenty of spies to interpret falsely the few English sentences which escaped me.

As the moment approached for the king's visit, his courage failed, and as it suited my purpose to re-visit Rewa, I went up to tell him my opinion. I found myself so perplexed by the falsehoods and misrepresentations, by which he had been misled, that I left him in disgust, but not without adopting secure measures for our supplies.

On the day following, yams in profusion arrived, but few pigs; and having purchased sufficient for our crew, I declined further barter until the arrival of more pigs.

On the 13th, the Starling returned, bringing three pintles, belonging to the Peacock, Captain Wilkes, of

Thokanauto (or Phillips)

Garrangara

Brothers of Chief Bowa Fiji

London. Henry Colburn, Great Marlbro St. 1843

the Vincennes, having in the handsomest manner despatched one of his boats to that vessel, thinking her size better adapted; at the same time offering those of the Vincennes, should they not answer. At this critical moment, our carpenter and armourer became ill. Fortunately, an engineer by trade happened to call upon me for assistance to recover property alleged to be piratically taken from him, and as he would be compelled to await the arrival of the parties, he consented to give his assistance in fitting and reducing the metal work, which he executed admirably; and by the evening of the 15th, we were in a condition to complete our voyage.

On the evening of the 15th, the tender of the Vincennes hove in sight, and Captain Wilkes himself very shortly came on board. Under any circumstances this was a satisfaction I had long hoped for, but in these remote regions, and entirely shut out from civilized beings, it became, independent of the feelings due to his promptitude in relieving our difficulties, matter of sincere satisfaction. Unfortunately I had only that morning despatched the Starling to fix the position of Banga, one of the new islands not placed on the chart, and had promised to join him on Monday. Having, however, been nearly eighteen hours together, we were enabled to talk over matters of much interest to both expeditions, and as they would go over part of our ground, their observations made in the same positions would become doubly interesting.

Our observatory and tents being embarked, and rudder in order, after dinner we parted; and by the aid of the moon the Sulphur was again moving through the waters with her accustomed freedom.

The United States Expedition, under the command of Commodore Wilkes, had very recently returned from the Antarctic regions, *via* New South Wales, bringing us later English news than we had previously seen. They had visited the Tonga group, and had been about six weeks examining the Feejees, of which they intended to complete the chart. When I state that four large islands occurred in our passage alone, which are not placed on the charts, and that many unnoticed exist in the whole group, which is most erroneously set forth in the charts, the value of their labours may be easily appreciated.

Owing to threats held out that vengeance would be taken for the capture of the chief by the Peacock, I did not conceive it right to risk the chance of aggression, by permitting our parties to pursue their examinations where our force could not act; consequently, beyond the island of Nukulau and the beach-line little was obtained.

The anchorage of Nukulau is safe, as well as convenient. Two safe and easy passages lead to it, and with the assistance of the chart, vessels can enter at all times without a pilot. The eastern channel, by which the Sulphur entered, is also safe, if assisted by the chart and a boat ahead. The best anchorage is in twelve fathoms, with the outer

island barely shut in with Nukulau, about two cables length from the shore, in a muddy bottom. The strongest breezes blow from south to south-west. Water can be had at Nukulau, or by sending up the river. The Sulphur watered at the island.

At present there are so many doubts about the *proper* name of the main island, that I retain "Ambow,"* this being the name *understood* by the chiefs and natives, and it has stood sufficiently long on the charts for preference.

It is traversed by very extensive rivers, and the chiefs assert that in the rainy season the fresh water prevails one mile beyond the breakers. It is also asserted that no one has yet reached the source of *this* river, and that numerous other similar streams exist. The Americans made the attempt, and I am informed penetrated six miles beyond any previous white person. I am not aware of anything to repay the labour, which probably would entail sickness on the exploring party. The mountains are lofty, and exhibit deep ravines between the ranges, which alone would account for powerful streams. They are generally shallow, and not adapted for navigation.

A code of regulations has been drawn up and signed by mark, for the chiefs of Rewa, (not of Ba-ou,) but as they neither read, write, nor understand the laws they have enacted, (possibly Phillips may be an exception,) they will prove a dead letter.

* I think, although Ambow on charts, that it should be written Ambauo. Bāuō being the residence of the principal or king.

Their implements of war are clubs, spears, bows, and arrows; but the club appears to be that generally in use. Probably the spear may be used on the first charge, but in conversation they never say that "a man was speared;" it is invariably "clubbed." These clubs are very neatly made, of a strong hard wood, resembling live oak in grain, and ornamented with coloured sennit, made from cocoa-nut fibre. They generally carry with them short clubs, similar to "life preservers," which are the club root of a peculiar tree affording a knob about the size of an orange, the stem, or handle, seldom exceeding three quarters of an inch in diameter. These are either carved or smoothly polished. It is a very formidable weapon, and probably, excepting in actions where numbers are engaged, their most fatal instrument of death. They readily part with any of their arms or ornaments for whale teeth, which are at all times irresistible articles in traffic.

The costume of the men is similar to that of the Tonga group, or most of the Pacific Islands, viz., a simple maro round the waist. The chiefs who possess European finery, seldom exhibit it, excepting Phillips, (Thokanauto) who generally made his appearance in white trowsers, shirt, waistcoat, and surtout. Indeed, I would not permit him to visit the ship in any other costume. This chief speaks English, French, and Spanish, is clever and intelligent, and has made one or two voyages in an American trader to Tahiti, and the neighbouring islands.

It is probable that he will shortly have the chief power at Rewa, as he broadly hinted in the presence of his brother. It is to be hoped that he will attain it by a more civilized process than the customary mode.

The king or principal chief of Ambow, "Old Snuff," as he is termed, resides at Bauo, or Bow, about thirty miles up the river, and near to the river which empties itself northerly at Obălauo. His son, "Young Snuff," is described as an active, intelligent young man, much prepossessed in favour of our countrymen.

Indeed, the abstraction of the Rewa chief by the Americans has irritated the natives amazingly, and will probably injure their mercantile interests. The story told here is that this chief resented some indignity offered him by an American trader on some former visit, and on the return of some of the crew in another vessel, they were "clubbed." It is stated that he was kept chained in her main top, but escaped, and swam ashore. However, on the arrival of the American squadron, the Peacock was despatched to demand this chief. His capture was achieved as before stated. This was the version given by the missionaries. Doubtless we shall hear the facts in a more authenticated form, when the narrative of the exploring voyage comes out.

Both men and women take great pride in dressing their hair. Although it is long enough sometimes to reach to the waist, it nevertheless has a

strong disposition to curl or frizzle, and the main object appears to be to render each individual hair independent, presenting an uniform mob, similar to the wigs of our bishops. In one instance I measured the distance from the skin to the outer edge of the hair, which was six inches. In some cases of the first class queens, the external shape was beautifully even and round, generally coloured by powder, of a very light lead colour. The men in many instances have their hair party-coloured; sometimes black, red, blue, and lead, or dirty white, on the same scalp. In several instances I noticed a single red *long* lock cultivated from the side of a thick frizzled black mob. These colours are obtained from different barks, the whitish or lead colour from the ashes of the bark of the bread fruit-tree. Those who cannot maintain a barber frequently cover the hair with tapa, which gives it the appearance of a turban.

This style of dress, with their thick black beards, and tapa thrown over the shoulder, gives them a Turkish aspect. They are inordinately fond of paint. Vermilion is equal to gold; but failing this, they besmear themselves with a thick coating of lampblack, and oil or varnish, and vary it by scoring off until the skin shews, or by coloured ashes. Their chief object in dress is to render themselves as unlike human beings as possible; the more terrific, the more admired. They have nearly the same abhorrence of a white skin as we have of a black one.

The women wear an ornamented belt, about four inches deep, with six inches fringe, called a leekee. They are very neatly worked, and are becoming. The queen of Rewa had no other covering. Her hair, however, was very neatly dressed, and as perfect as if she had come from under the hands of a French frisseur.

I am afraid that the missionaries will find these people far beyond their powers. They have no chiefs of sufficient importance to carry into effect any important change, and possibly if any one attempted it otherwise than by example, his head might pay the forfeit. They are too self-willed and independent to be driven, and at the present moment far too ferocious to submit to any restraint.

I put the question to Phillips, who answered immediately to the point. "They have no objection to the residence of the missionaries, and would feed them; and would not molest any one voluntarily embracing their religion. But they dislike their spying into their houses. By-and-bye, when they see more of them, and *understand* them, the people may come round."

"But," I observed, "the chiefs should set the example, as the kings of all the other islands have done."

"What did they *give* them for helping them?"

I replied, "Nothing; they were induced by the

superior advantages which the christian religion offered."

As he could not be made to comprehend this part of the subject, and appeared restless, I changed the topic.

With a light air from the eastward, we pursued our course for the island of Banga, and about four A.M. observed the Starling at anchor. Lieut. Kellett came on board at daylight, but as nothing offered of sufficient interest to detain the ship, I merely landed to secure the position, and complete the survey which had been commenced by the Starling.

The anchorage is safe and convenient, and probably, had I been aware of its existence, would have been selected in preference to Nukulau for our astronomical position, as being more detached from a large population. Not long since it possessed its full portion of inhabitants; but on the death of their king, who was tributary to the king of Rewa, the chiefs determined to throw off the yoke, and become independent.

Such a pretext for war was not overlooked, and a band of warriors immediately issued forth to reduce them to submission, or in plainer terms, to rob them of all they possessed. This was found difficult by reason of their fastnesses, the towns being situated in many cases on the very summit of the mountains, elevated one thousand four hundred feet above the sea

Finding they were not sufficiently strong, reinforcements were demanded, which were sent under the command of Garingaria, or raised by him under a contract that he might exterminate them. His brother, Thokanauto, (or Phillips,) who is upheld as the white man's friend, (but only so long as he can get anything from him,) was foremost in destroying the villagers by fire, and committing other brutal acts. The expedition resulted in victory to the besiegers, the death of the principal chief, and several hundreds of the population. The son of the chief was spared to govern, under the usual subjection.

The sequel will hardly be credited, yet it is beyond doubt: cannibalism to a frightful degree still prevails amongst this people, and, as it would seem, almost as one of their highest enjoyments. The victims of this ferocious slaughter were regularly prepared, being baked, packed, and distributed in portions to the various towns which furnished warriors, according to their exploits; and they were feasted on with a degree of savage barbarity nearly incredible! They imagine that they increase in bravery, by eating their valorous enemy.

This Garingaria is a noted cannibal, and it is asserted that he killed one of his wives and ate her. This he denied, and accounted for her death (which took place violently by his order) on other grounds. He did not attempt a denial of his acts at Banga, nor did Phillips. These occurrences are of late

date. I am told they threw one or more of the heads (which they do not eat) into the missionary's compound.

The population of the Feejees are very tall, far above the height of any other nation I have seen. Of five men assembled in my tent, none were under six feet two inches. It was rather an awkward subject to tax Garingaria with in his own house, and solely attended by his own dependent, our interpreter; but he took it very quietly, and observed that he cared not for human flesh, unless it was that of his enemy, and taken in battle. When he used this expression, I could not help thinking that his lips were sympathetically in motion, and that I had better not make myself too hostile. I therefore bid him good evening.

Quitting the unfortunate island of Banga, we steered a course to pass close to Cantab, and the following day passed its western extreme, steering for Tanna, one of the southernmost of the New Hebrides.

On the 20th we made for the island of Erronan, which, from our great distance, presented the appearance of a low flat island. On the following morning we passed about seven miles to the southward, when a nearer view showed it to be a very high truncated cone, well wooded, and surrounded by a low belt of flat land, projecting about half a mile beyond its base. We were not sufficiently near to observe inhabitants, or if landing or harbours existed.

Shortly after, the island of Annatom was noticed to the S. W., and Tanna west. Annatom presents undulating hills, but no remarkable peaks or striking features. Tanna is a larger island, presents high peaks and ranges on the southern portion, with very abrupt cliffy bluffs.

Port Resolution may readily be found, by a very remarkable yellow sandstone bluff at its north-west angle, and which is situated to the northward of the entrance; also by the smoke of the volcano, a little inland from it. Approaching from the southward, the entrance of the port might be overshot, by reason of the overlapping breakers; but by bearing in mind that it is formed by the *low peninsular* south-east angle, and that the entrance is situated about one mile southerly of the yellow bluff, it will easily be found.

By noon we reached the entrance, the wind being dead out: but by edging close to the breakers on our left, and hauling sharp up, we made the entrance, and in four boards reached our berth inside in six fathoms. It is too narrow for a long vessel to work in, and it is preferable to shoot into fifteen fathoms, and be prepared to warp.

We were soon visited by the natives, in some of the most miserable apologies for canoes that we have yet witnessed. In one of these frail barks came the resident missionary, a native of Samoa, one of the Navigator Group, left here by the missionary vessel to convert these people. I took him

with me to select a position favourable for our observations. This did not appear likely to be effected on the eastern side of the bay, and we therefore commenced those requiring the most undivided attention on the western rocky cliffs. The natives, however, soon began to find us there, which, added to the frequent vibration from the volcano, determined me on trying the town side the ensuing day.

Being short of fuel, and depending on the peaceable character given of these people by Cook, added to the presence of the messengers of peace and good will, I determined on making the most of time here, and parties were accordingly despatched wooding, as well as making the survey of the port.

Our observing position was pitched in front of the house of the missionaries, a mere thatched hovel, in which five unfortunate natives of the Navigators were literally imprisoned, being compelled to close the door, immediately one entered or departed, to prevent the intrusion of the natives. Their number consisted originally of six men and two women, but their chief (or king, as they termed him,) died not long since, and the remainder were suffering more or less from fever and ague. They appear to be very uneasy and unhappy, and painfully anxious to return to their native land. They enquired most anxiously and eagerly if we were bound to the Navigators; and although their stock of English was but scanty, we could plainly understand that they were in great fear

from the natives, and much dreaded our departure. They were, moreover, aware of the melancholy fate of Mr. Williams and his companion, at the neighbouring island of Mallicolo.

It was with feelings of deep disappointment that our mutual ignorance of the language prevented me from using any exertions to smooth their way with the natives, who appear a most lawless set. The surgeon inquired into their complaints, and his prescriptions probably afforded temporary alleviation, but, with the mind so much depressed and harassed, I fear recovery is problematical. The only chance they now have, is the return of the missionary vessel from New South Wales, when they will be doubtless removed to Samoa.

The fatal catastrophe to Mr. Williams, and his companion at Mallicolo, has not failed to make a deep impression; and although the natives endeavoured to persuade us that they abhorred the unnatural practice of cannibalism, I should be very sorry to be placed at their mercy. I certainly felt a more than ordinary interest about these unfortunate beings, and the frequent repetition of "Samoa, Samoa," from the sick within the hut, sounded like the cry of the condemned.

During the course of my pursuits, I was frequently annoyed by the natives intruding too closely on our tabu lines, although frequently warned by their own chief, as wells as one of the missionaries, to preserve the prescribed boundaries. It was unfortunate that

we had so many irons in the fire, otherwise I could have placed sufficient men on the lines of demarcation to have effectually deterred the ill-disposed from seeking a quarrel, for which several were evidently much inclined.

I had also a strong reason for keeping up a good understanding, without arms, if possible, in order to show them how little we feared anything from them, want of decision generally, in my opinion, acting rather as an inducement to molestation. Had force been resorted to, I also foresaw that their spleen might have been vented upon the unfortunate, unprotected missionaries, who were already dreading our departure.

Though their actions, to other visitors, not similarly occupied with ourselves, would have been deemed harmless, they, monkey-like, no sooner comprehended that they could, without serious displeasure, annoy me by the vibration of the ground at the moments for observation, than they commenced simultaneous poundings with billets of wood, and threw stones high into the air, which fell near and risked the instruments. In order to secure the last and most important set, (which can only be comprehended by those as intently engaged,) I found it necessary to clear the ground to a certain distance, and to effect this, recalled one of the cutters; letting the chiefs understand my determination.

The instant the crew landed, they enforced my wishes, and the yell of departure, half serious, half

comic, which burst forth, had nearly awakened the slumbers of the Sulphur, which had kept an attentive eye on our movements. Anything, even in mimic hostility after this, would have drawn an unfortunate shot: of this I was not aware until my return in the evening. However, a few minutes sufficed to complete what I required, when I hastened to remove anything like bad feeling, by mixing immediately with them.

The sentinel having reported that one of the natives raised his club with a threatening attitude, when he warned him off the instruments, I immediately went to him and desired him, by signs, to lay down his club, which he immediately did, trembling. I then gave it in charge to the sentinel, who placed it under his foot for safer custody, and the native was ordered out of bounds. A cry of derision at his expense followed. The chiefs were with me, and requested me to be quiet, ordering the people back. After great intercession on the part of the chiefs, and on condition that the man was sent entirely away, I allowed the club to be restored to his chief. This shows how completely savages may be reduced from insolence to abject fear, by even pretending determination, for I was unarmed. But as it was done in a good-humoured manner, and made a joke against the party, it failed to procure him support had he been inclined to resist.

Very little was brought to the beach for traffic, although on my landing the first question asked, was for "permission to open trade." The little that

they did bring consisted of large yams, (weighing thirty-six pounds,) plantains, malay apples, sugar-cane of very large growth and very tender skin, and a few small chickens. The ornaments brought were light bows, arrows, and carved wristbands made from the shell of the cocoa-nut. They were not disposed to part with their clubs, or the bits of serpentine suspended to their necks.

In all their productions of art they were far behind any of the islands we have visited. They differ also from any hitherto noticed by us in their costume. The hair is bound into minute ringlets, about one twentieth of an inch in diameter, the last three or four inches of the ends being allowed to curl, or wave, so that it assumes a thick wig of lines, fagged at the ends. They are very plentifully smeared with black and red paint, the latter resembling very coarse ochre, but vermilion they did not value.

They do not wear the customary maro, or tapas, on the loins; but follow the custom in many parts of Africa, of binding matting, terminating in ornaments. The women wear a petticoat, very similar in fashion to that of Nootka, Columbia River, &c., but formed of the loose fibres of the Hibiscus tiliaceus, (or Purau.) This is heavy, and being sometimes worn diagonally over one shoulder, forms a covering to the side exposed to the sun. The septum of the nose of the women is perforated, and from the size of the aperture, calculated to sustain a weighty ornament. The lobes of the ear, in the males, are also perfo-

rated, but no ornaments were displayed in them. The men also wore shells round the arm, above the elbow, (generally Ovula Ovum,) and some few had pretty cones and bulla round the neck; but we were unable to procure a single live shell from them, although they were distinctly aware that they would receive ample compensation for their labours.

Altogether they appear to be very low in the scale of human beings, little inclined to traffic, filthy, ill-looking, insolent, and troublesome as a people. Of course there are exceptions.

Our party employed wooding at the extreme end of the bay, were latterly troubled by their throwing stones, but this probably arose merely from a mischievous disposition.

By four o'clock our operations were concluded, and having presented to our unfortunate friends the missionaries, some few necessaries, and taken leave not without some misgiving as to their security, I walked to the extremity of the bay, towards the ship, the gig keeping pace along shore, purchasing occasionally the few things brought down by the natives, who continued to throng about me with much good-humour. I pursued this course purposely, in order to discover if any ill-feeling existed amongst them; and to ensure keeping them at a respectful distance, I very quietly borrowed the club of the nearest man, without the slightest resistance on his part, (although generally they are very tenacious on this point, when

arms are near,) and used it to make them preserve their distance.

These acts, although trivial to the reader, were performed in a manner which I have never known to fail amongst savages. If resistance is shown I do not persist, generally leaving the matter to the feelings of those around. But I have never failed in obtaining my object, and restoring harmony, even when I suspected I had outraged any of their superstitions. If success be proof, I have judged correctly; for I never had occasion in my life, where my *own will* guided, to have recourse to force.

By the time I reached my point for embarkation I found them all in good humour, anxiously inquiring if the ship *slept* in the bay, and when we intended to depart; at the same time making motions to cry, and following us off with Aloha Aleeke, or "good-bye, chief."

Our gentry who were exploring in pursuit of natural history, were not altogether unmolested, and this circumstance, added to the shortness of our visit, prevented their penetrating far inland. The volcano smoked and muttered occasionally, and, when the breeze blew from it, brought a plentiful supply of cinder dust.

The habitations of these people are, in general, mere huts, which I should have supposed temporary, had they not exactly corresponded to the description given of them by Cook. He terms them merely the thatched roof of a house. They are, however, even

inferior to that, being simply high enough at the apex for a man to stand upright, and certainly not exceeding six feet spread at the base. Their gardens appear to occupy more of their attention, being neatly fenced in with reeds.

The surgeon visited the hot spring at the base of the cliff, mentioned in Cook, but the water did not appear to contain anything to render its taste unpleasant.

CHAPTER III.

Quit Port Resolution—Tanna—Pass Erromango — Arrive off Island of Guadalcanar—Dangers of Guadalcanar—Proceed to Port Carteret—New Ireland—Examine Port Gower and Turtle Bay—Visited by natives—Quit Port Carteret—Pass Duke of York's Island — Visited by canoes—Articles brought for traffic — Mother and Daughter — Proceed towards New Guinea—Sighting Elizabeth Island and Admiralty Group—Pass the Britannia Islands discovered in 1795—Land, and survey Port Victoria—Visit of natives—Thermal springs—Quit Port Victoria, and examine coast of Guinea—Structure of canoes—Pass "Los Crespos"—Anchor off Arimoa—Visited by natives — Habitations — Floating islands — Reach island of Jobie—Description of—Quit Jobie—Pass Goelvink's Bay—Fix position of Middleburg and Amsterdam—Land at Pigeon Island—Dampier Strait—Pass Ceram—Anchor in Cajeli Bay —Bouro—Quit, and reach Amboina.

CHAPTER III.

At dawn on the 24th June, with light airs from N.W., we quitted Port Resolution. Several canoes came off, bringing fowls and fruit, and followed us about a mile, and when they quitted, repeated their aloha, accompanied with invitations to return. It is very probable that another day's sojourn would have made us better acquainted, and exhibited a better market.

The breeze did not permit us to steer a course, and we were barely able to reach a low island to the N.E., mentioned by Cook, which is situated about ten miles to the northward of the port. As we approached, the natives flocked to the beach, where we plainly discerned two, attired in frocks, trowsers, and hats, whom we immediately set down as missionaries, probably part of those from Samoa. Several canoes put off, but pulling too far ahead of where we should fetch, failed in reaching us. We tacked within musket-shot of the rocks, which in

several places appeared to afford convenient cover for landing.

Our next board brought us well in with the north point of Tanna, near sunset, and shortly after tacking, the breeze gradually favoured, until we were enabled to make a free course, during the night, past Erromango.

I had failed in putting to sea the previous evening, in order to allow my crew their full night's rest, as well as in the hope of being able to pass Erromango by daylight, and sufficiently near to communicate with the canoes, or probably to land and determine its position. It was, therefore, a disappointment, after the late lamentable occurrences at this island or Mallicolo, that they had not the sight of other vessels of war, to afford them the impression at least that Great Britain will not lose sight of her subjects scattered over the vast surface of the globe. I might possibly have derived other information as to their present disposition.

At daylight the remarkable saddle peaks, situated over Traitor's Head of Cook, and by which this island may be particularly distinguished, were seen about fifteen miles to the southward. The breeze fresh from S.E., afforded us strong hopes of soon nearing Sandwich Island, and by sunset its outline was well defined. We found ourselves set considerably to the northward by the current, and changed our course to keep well off the land.

Shortly after eight o'clock breakers were reported

to leeward. The ship was tacked, and we stood off an hour without observing them. We again tacked, and kept the wind until the morning. The report was evidently incorrect, as our position at dawn evinced. By noon we were about fifteen miles off the north end of Sandwich Island, with several smaller in sight in the northern quarter. Our course was shaped to clear the island of Mallicolo, which at sunset was not visible. Wind easterly, with very unpleasant cross swell from S.W., as well as S.E.

It was my intention to touch at the island of Guadalcanar, or the nearest convenient spot in that meridian. On the morning of the 1st July we made the island; weather very unsettled, heavy rain and squalls, and making but little progress against a strong S.W. current. By noon we had reached a small islet off the northern point; but experienced a very unpleasant sea, and heavy breakers were noticed extending a considerable distance in the offing.

Quitting the ship, I ran in with the Starling, until she reached seven fathoms, when, disliking the sea then running, which would have prevented her clawing off in the event of danger, I proceeded in my gig to examine the inner side of the island. Unfortunately no depth for safe anchorage could be found, although the facility for landing rendered this a most eligible spot for our operations. I had previously intended standing, off and on, during the night, and landing in the morning, but on my

return to the ship, finding the current set strong towards the breakers, and moreover having split our foresail, the ship being very uneasy, I determined on seeking a more eligible situation, and bore away for New Ireland.

The breeze favoured us, but a strong current from N.E. prevented our making the land on the evening of the 4th. Unfortunately we had no meridian observation on that day, and heavy squalls with thunder, lightning, and rain, (or the customary rainy season of this region,) overtook us about eight o'clock, at the very moment when we hoped to reach our port.

About four A. M., we found ourselves close in with the breakers, the squall providentially clearing up just in time to wear clear of destruction. Calms and baffling winds ensued, preventing our reaching our port by daylight; but the weather proving fine, and obtaining a fair view of the landmarks, we had no hesitation in running in by night,—although it had been well if Carteret had stated that the passage between the Booby and the main was unsafe. Between the flaws and warping we reached our anchorage in port Carteret by midnight; affording to our crew a good night's rest, instead of knocking about at the mercy of swell and currents outside. We were fortunate, as the rains recommenced at dawn, and continued with slight intermission during the whole period of our visit.

On the second day we succeeded in securing our

principal observations, and the main triangulation of port Carteret. I then joined the Starling, and proceeded to complete the coast as far as Cape St. George, leaving the Sulphur to complete wood, water, &c. Rain still impeded us, but by perseverance and taking every advantage which offered, this was eventually achieved.

This southern bay is termed Gower's Harbour and English Cove. The latter is more peculiarly adapted for watering, but does not afford sufficient facility for ingress or egress without towing. At the southern extremity of Gower's Harbour, we fell in with a party of five natives, one of whom spoke a little English. From him we learned that the visits of British vessels from Sidney were frequent; that the natives who communicated with them resided on the eastern side of the island; and that their supplies consisted chiefly of wild hogs, fruit, and vegetables. He was anxious to sleep on board the schooner, to which we consented, and his allies, youths from sixteen to eighteen, were despatched home, with directions to return the following morning with stock, &c.

The inclemency of the weather, I suspect, prevented this, and our labours having terminated, our new friend "Tom Starling" (for Jack seldom fails to christen his friends) was landed, and we rejoined the Sulphur that evening.

"Tom Starling" informed us "that the rains would cease in one moon, and that they would then

be considerably more oppressed by the sun." The *continuance* of the torrents of rain has certainly surpassed anything I have before observed in any other clime. Our good fortune, however permitted us to obtain sufficient sun the day following our return, to rate our chronometers, and thus released us from further sojourn in this land of moisture.

Just on the eve of departure, half a dozen miserable half-drowned natives came down to the watering place, bringing a cooked pig, with a few bad specimens of bread fruit. They did not understand English, and having presented them with a few beads and other articles, they were relanded, taking with them their pig, &c. They were entirely naked, very slightly made, and resemble much the natives of Tanna, the hair in the same minute queues, with bushy points, although not bound up.

On the morning of the 16th, having embarked the observatory, we quitted Port Carteret; the day beautifully fine, but wind light.

Having examined the range comprehending Ports Carteret and Gower, I should certainly on any future visit prefer what in our survey I have designated Port Sulphur, as that under every circumstance the best adapted for wooding and watering, ingress and egress under canvas, and affording, what is most important, convenient depth for anchorage.

In Gower's harbour the depth is not only inconvenient, being thirty fathoms, but there is great liability to drag off the bank. In English Cove the

swell sets in so heavily at times that it may be difficult, or impossible, to tow, and watering is not so convenient as in Sulphur Bay.

For a temporary supply without intending to anchor, the stream at the southern bay in Gower's Harbour will be found most convenient, as a vessel might drop towards the passage through Gower's Harbour, and pass out by Turtle Bay. The anchorage in Turtle Bay is bad, by reason of the rocky bottom as well as great depth.

During our stay there, for two days, in the Starling, we experienced the shock of an earthquake, which led us to believe that we were dragging over rocks. The same was experienced on board the ship at the same instant, and those on shore state that they felt the undulation strongly.

Fuel of the best quality is to be had at the beach in any of these harbours, as well as fancy woods for cabinet making, including tamanu, ebony, &c. The nutmeg was found, but not abundant, nor of the kind valued in commerce.

Although Captain Carteret named the greater island in Port Carteret Cocoa Island, from the abundance of cocoa nuts found there at the period of his visit, not a single tree of this fruit now exists. The bastard sago palm, pandanus, &c., grow luxuriantly, although the depth of soil is literally nothing, the trees rising through the loose limestone rock.

The structure of the reefs, points, cliffs, &c., in this region is entirely limestone, frequently crystallized,

but it is rather remarkable that on three islets forming these harbours all the rocks near the beach are loose, and apparently disturbed by some violent action. In the main streams, sandstone, claystone, and porphyritic balls were found.

The breeze, failing with an unpleasant swell setting on the islands, compelled us to warp as well as tow, and it was not until noon that we considered ourselves safe on our own element again. The breeze just favoured us in time to send our men to their dinner, for which they doubtless had good appetites, and our head was then directed for Duke of York's Island, which we reached the following afternoon. We were visited by several canoes bringing cocoa-nuts, bananas, pine apples, and several fruits unknown to us; also some few shells, principally nautilus, (pompilius.) These were readily purchased for beads, but the natives were very timid and could not be persuaded to come on board.

On the day following we ran along the north western side of New Ireland, in order to ascertain how far the natives were disposed to barter, and what they had to dispose of. Many canoes put off, and, after some solicitation, not only came alongside, but the natives ventured on board. Viewed in their canoes we thought them a tall race, but I was much surprised, on actual measurement as they were standing beside us, that the man I had selected as their stoutest and tallest did not exceed five feet seven, and was spare withal.

The canoes, which appeared for the most part to be new, are constructed from a hard white wood with a red core, (probably a mimosa.) They are very simple and neat, and furnished with the customary outriggers. They generally contained three or four persons. The largest, which was about fifty feet in length, contained eight. All those who came off in the canoes were male, and entirely naked, but the females, whom we discerned dancing and waving along the beach, were covered with the leekee of the Feejees and new Hebrides. The natives who ventured on board had each a single leaf stuck in their belts, but no more.

As they brought nothing but cocoa-nuts and very small bread fruit, and were moreover very difficult to please, we very politely caused their departure, by slightly increasing our speed. I have little doubt that had we been able to anchor, stock, &c., would have been easily procured.

The indentations of the coast appeared to offer several very snug little harbours, and judging from the numerous canoes as well as from the population we saw on the beach, added to large patches of cleared land, there can be little doubt that they have sufficient produce. Probably the distance at which we were from the land at the time they put off prevented their risking live stock.

On the day following, being a little further in advance, a large and handsomely finished canoe, with

the figure-head turned inwards, paid us a visit, but were too timid to communicate. Doubtless she contained a chief, as those who managed her were silent, and did not even notice our advances to friendly communications. Our indisposition also to delay longer in this region of rains, calms, and variables, did not induce us to make much repetition, although, so long from home, "New Irish" was a novelty in our ears. The season certainly was most unfortunate, as from the nature of the coast before us I could easily imagine the scenery in fine weather to be magnificent.

The hills of New Ireland rise to a height of fifteen hundred to two thousand feet, and are clothed from base to summit with the most luxuriant forest. In the distance the high lands of New Britain, with the magnificent peaks of "Mother and Daughter," afford a fine finish to the landscape.

In a mercantile point of view I cannot at present perceive how these islands can prove interesting beyond the fancy woods and tortoise shell, of which latter substance every canoe appeared to possess several plates. It is of good quality, better than I have before noticed in the Pacific, and from the manner in which it was offered no doubt vessels come here to trade for it; indeed we learnt as much from Tom Starling.

It was unfortunate that such an opportunity for acquiring a more perfect estimate of these islands and their resources was completely marred, by the

dreadfully tedious weather and long sick list, which rendered further delay impossible.

We continned making but little progress through torrents of rain, and pressed by the current about one mile per hour to the N.E. On the 23rd we passed Elizabeth Island, and saw part of Admiralty Group, and on the 24th, with fine weather, passed Purdy's Island, finding the current still pressing us to the northward.

On the 25th of July, the group laid down on Arrowsmith's chart as the "Six Islands," seen by the Britannia in 1795, were in sight, as well as several other low islands to the southward, which probably escaped notice, amounting in all to ten. At midnight the westernmost was discovered ahead, but at day-break, appeared to compose part of the main land of New Guinea.

Two more low islands were also observed to the northward, and as my principal object was to select a spot free from basaltic or volcanic influence, these appeared to offer an eligible position. About the same time a deep bay was observed on the S.W. angle of what I now believed to be merely a peninsula, and my friend Kellett was immediately despatched in the Starling, to examine it, in the event of failing to find safe anchorage amongst the low islands.

On rounding the reefs which break the eastern swell, everything appeared to favour a convenient position. Lieutenant Wood was despatched to

search for anchorage, but as no bottom under seventy or eighty fathoms could be obtained free from danger, and the Starling about the same time having signalled "the port examined safe," our exertions were directed to reach it before dark. A constant current setting to the N.E., added to variable squally weather, prevented our reaching a position before nine o'clock, when we anchored near the Starling in twenty-five fathoms, mud. Kellett having anchored her at sunset, with orders to show a light, joined us to pilot us in.

The morning (27th July) showed us a very snug and picturesque bay, but heavy rain prevented our landing until eleven, when a sandy spot on the north side of the bay was selected as most convenient, and commanded by the ship's guns. To prevent the chance of misunderstanding, a sufficient force was landed to put anything like opposition out of the question, and a space soon cleared for our tents.

The natives, who met us, appeared rather nervous, but very soon recovered their self-possession, and exhibited more good-humour than the accounts of previous navigators had led me to expect. They brought but little to traffic, and appeared to be impelled more by curiosity than any other motive, and, although the means were at hand, (by procuring shells and other curiosities,) they could not be induced to exert themselves, probably fearing to go too far from their arms, which were no doubt con-

cealed in the bush. Their costume was entirely new to us; resembling nothing we have seen. The hair, which is permitted to grow to a great length, is confined behind by a conical case, having the crown as its base, and generally tapering at eighteen inches length to three at the point, the hair curling over. Into this preposterous appendage they stick their feather ornaments, either birds of paradise or canes with gaudy feathers of parrots or other birds neatly worked on, which add about eighteen inches to the length. They are generally in a state of nature, but in many cases, particularly the older people, have a dirty tapa about their loins. In stature they seldom reach the height of five feet four inches, and average about five feet. They are small-limbed, and did not exhibit any symptoms of strength; and from what we observed in their dealings, I am inclined to think them well-tempered.

Their canoes are formed from single trees, with wash boards brought on very similar to others in these seas, but the fitting of the outrigger, and a seat amidships for the person in command, or to secure their goods from wetting, is very neat and convenient. It is a raised platform, about six feet by three, with ornamented sides, &c., about nine inches.

Our attempts to discover what articles they prized, or would be tempted to barter for, were entirely ineffectual: they preferred iron, axes, knives,

Natives of Port Victoria.

Britannia Group, New Guinea.

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&c., despised beads, but evinced no particular desire to possess anything shown to them. Latterly they brought some birds of paradise, but they were indifferent, and I am not aware what was given in exchange.

The constant showers during the day prevented our obtaining the necessary data for determining our position. We were, therefore, compelled to trust to the stars, the weather generally proving clear between sunset and two A.M. By midnight we had completed our observations, and about one embarked. The natives retired about sunset.

During the day the survey of the bay was completed. The depths throughout are regular, over a bottom of tough dark mud, varying from thirty to nine fathoms, which latter will be found close to the reefs, which in most places skirt the bay.

Streams of fresh water abound; that in the bight at the sandy beach is the best, and it *probably* runs at the dry season. On the south side of the bay a salt thermal spring was noticed, of which the temperature appeared to be nearly at the boiling point; it was, however, not strictly tested, our high temperature thermometer being broken. Wood is everywhere abundant at the water's edge.

On the morning of the 28th we quitted this very snug bay, which (as the first discoveries of these islands called them Britannia group) I have thought fit to name "Victoria Bay." This island is the easternmost of the group, and I have therefore called it

Britannia island, and the whole group " the Britannia Archipelago."

The day proving propitious, our survey was extended, by which we discovered that many points which we had mistaken for headlands, &c., leading into a large river, were the extremities of a series of islands forming a very extensive archipelago. Eighteen were counted from the mast head, and I have little doubt that further examination to the southward would have materially increased this number.

The lateness of the season, and our immediate duty in this neighbourhood, not permitting further exploration, I was compelled very reluctantly to be satisfied in effecting only what the progress of our passage would allow; and keeping within a short distance of the land, our head was again directed westerly.*

In natural history our short stay afforded but trifling scope. Some interesting micoscropic shells were found in the mud at the anchorage, a few from the beach, and one new land shell.

The geological composition of the island, as far as examined, proved to be jasper, but very much decomposed. The natives appear to take great pains in clearing and cultivating the land, and several brilliant green spots relieved the eye from the sameness of the dull forest tint. Our botanical collector was as usual indefatigable.

Our course along the land proved tedious, by rea-

* I hope that this portion may hereafter be explored.

S. Bull

Native of New Guinea

London. Henry Colburn, Great Marlbro' St 1843

son of calms and baffling winds: but aware that the current in shore was much stronger than out of soundings, our exertions were directed to keep near the land, where something very similar to land and sea breezes occasionally favoured us, but nothing regular. We did not fairly accomplish our object until the morning of the 1st, when we commenced a track survey of the coast, with a light favourable air, which permitted us to range within one mile of the coast.

About sunset we found ourselves off a very deep and extensive inlet, on the outer peninsula (or island) of which arose several very lofty and remarkable peaks, frequently hidden by clouds. Nothing of the kind is apparent on the charts, and the fact of our being some miles *inland*, by our latitude and longitude, evinces how little we know of the geographical features of New Guinea. We were visited by many natives, from whom we purchased weapons, and other trifles.

The day following enabled us to add little to the preceding, the currents having driven us, during the night, almost out of sight of some of our lofty marks. At noon we observed within one mile of the eastern-most of three low islands, *nine* being then in sight: these were "Los Crespos." By sunset we had reached the seventh, and tacked off shore for the night. The wind being light and variable; we anchored between them in thirteen fathoms. Here I

determined to remain, in order to fix their position, until noon, when we again moved westerly.

We were visited by great numbers of natives in canoes from these islands, and so far from displaying fear or distrust, they were very anxious to persuade me to land. Had calm prevailed, I most certainly should have done so. The natives were decidedly superior to, and entirely different from, those of the Britannia group. The hair was worn loose, and in ringlets, some having the minute tails of Tanna.

Each canoe was laden with bows, arrows, cocoa-nuts, and plantains; and several plates of tortoiseshell, which they freely exchanged for bits of iron hoop, beads, &c.; but some large blue China beads, which I had, were singly worth anything offered in the market. *One small blue bead* was fixed as the price of a cocoa-nut. The canoes differ much from any we have noticed on this coast. They are neatly built, and short, and seldom contained more than three persons. The people were good-humoured, docile, and honest. Many birds of paradise, but tarnished, were worn as ornaments; but not brought for barter. Tortoiseshell was sufficiently abundant to be worth trading for; the plates good, and the demand about six inches of rusty useless hoop, for each plate. No females were seen.

About noon the breeze favoured us, and having procured about three hundred cocoa-nuts, and supplies of bananas, &c., and also pretty well filled the

ship with ornaments, bows, arrows, &c., we weighed, and proceeded for Arimoa, then in sight to the N. N. E.

From our dealings with these people, who were probably inhabitants of the neighbouring low islands, we have every reason to believe them friendly and well-disposed. They were evidently in fear, as the slightest noise would instantly cause them to paddle off in alarm. But no dispute occurred in their dealings; they were always well satisfied and good humoured, and invited us to land. Several cases of disease (apparently leprosy) were noticed, and many have lost noses, and have their features otherwise much disfigured.

They chew the betel, with chunam; smoke their native tobacco, and wear as ornaments the tusks of the wild boar. The septum of the nose is perforated, through which I noticed (and purchased) a bamboo ornament above *one and a half inches in diameter*. The lobes of the ears were similarly distended to two inches. They are expert divers, frequently catching things which fell overboard, (even *beads*,) and manage their canoes with great dexterity. A small canoe which I purchased was very neatly ornamented by carved figures at each end. The sail is an oblong mat, very similar to that in use throughout these seas—probably Malay. Their bows are very plain, and made of the outer part of the bamboo; the arrows from a reed, about

six feet in length, and ornamented by burning with a hot iron instrument. The string is also of rattan.

The whole of the coast has, I believe, been visited by D'Urville. They are, without doubt, "Los Crespos" of the old charts, but the natives call the island which we anchored off, Yamna, which name I find is known at Arimoa.

The following morning brought us close up with the islands of Arimoa, Moa, and Insu, or close under the south end of the southern Moa. The weather being hazy, with rain and little wind, prevented our effecting much of their delineation. Numerous canoes from Arimoa visited us, and for a short period trafficked without reserve. Iron hoop had fallen desperately in value, and nothing but knives or beads would succeed. The incautious appearance of a sentinel, with his musket, caused an immediate panic, which we were unable to dispel; and, although compelled by calm to anchor close off their village, not a soul came off during the remainder of that day, although they remained in their canoes at a short distance in shore, laden with cocoa-nuts, bananas, &c.

From the natives we learned that they acknowledge the names on the charts, with the addition of the syllable *too*, as Arimoa-too, Insu-too, Moa-too, with a perceptible division of the *too*, as if it implied island.

The articles obtained from these people differed

from those of our Yamna friends, their bows being less finished, and arrows not so long. It appears that each tribe preserves an established *length* of this missile.

As our distance from their village enabled us to see their huts and inhabitants very distinctly, by aid of our telescopes, we were able to make out that their houses are constructed similarly to those described as customary amongst the natives of New Guinea, viz. the huts are constructed on platforms elevated on piles about ten or fifteen feet above the ground. A thatched pitched roof rises direct from, and overlaps, the platform, (similar to the attic of our pitched-roofed houses.) It is closed at the ends by a window, used also for the door, about three feet square. The ascent is by a ladder or notched post laid slanting to the window.

The features and structure of this race differed from those of Yamna. They are more athletic, appear to possess more determination, as well as craftiness, and, probably from the fear of firearms, have had reason to repent some aggressions on a former visitor, or, equally probable, have been made to feel the blessings of communicating with white men who wished to drive their bargains *vi et armis*. We had no reason to wish for closer acquaintance by admitting them on board, and had this been permitted then it would certainly have been attended with great caution. They appeared as much afraid of a telescope as of firearms.

As their women and children were plentiful on the beach, they could have little idea of hostility; and from this circumstance, I am inclined to suspect them the injured instead of the aggressing party.

We were afforded an opportunity of observing that the females are clothed similarly to those in the neighbouring islands, viz. by a matted fringe from the hips to the knees.

Finding our neighbours still disposed to keep aloof, we warped to the edge of the reef, and with a light air cleared the island during the night; but anchored a short distance to the westward, where we remained until after noon the day following, in order to effectually fix the position of the island. Our anchorage was in eleven fathoms, mud, twelve miles at least from the nearest land.

From the point off which these islands are situated the coast appears to undergo an immediate change to a low swampy mangrove archipelago; the numerous gaps being either the channels between them, or the mouths of large streams. The fact of many being islands was fully proved by observation, at their termination in the great northern gulf. I have little doubt also that large estuaries or rivers contribute to form the great mud flat which extends to such a distance from the land, as very strong currents were experienced, and many floating masses torn from the land (containing whole palm-trees) indicated more than mere tidal action.

On the afternoon of the 6th of August we moved with a light air and current from the eastward; and the water continuing to decrease, hauled off, until we reached fifteen fathoms. Much to our astonishment, several strange sail were reported, and they rapidly increased to a fleet, as we imagined, of canoes.

Having, however, directed our course towards the nearest, we grazed it sufficiently to sweep our copper well, as it proved a large peat island, with a palm bush.

Several sea-snakes were observed, differing from those generally noticed, and one taken in the trawl was preserved. A rare nondescript shell also taken.

The openings in the coast became more numerous, and left little doubt that our pigmy fleet resulted from the islands abreast of us. The depth at eight or nine miles from the land being only nine fathoms, prevented our making any close examination of the coast, and at dark we dropped anchor for the night.

In the morning we resumed our course, and succeeded in detaching several of the western group of islands, which at length showed us a passage between the westernmost, and what we *assumed** to be the island of Jobie on the charts.

Through this channel a strong tide set against us, compelling us again to drop anchor. Many canoes came off from the low islands near us, on which we could discern several villages, the houses, however, exhibiting red roofs, which, from the material employed

* *Assumed,* nothing like the chart.

for the construction of their buckets, I suspect to be the palm-sheath, of which several neat little buckets, which we obtained, were constructed.

The natives of these islands were superior in features, cleanliness, &c., to any who had yet visited us. Their canoes were better finished, their weapons more numerous, and the numbers in each occasionally amounted to eighteen. They were furnished with double outriggers, and set their mat sail, sheer fashion, on a tripod, serving for stay as well as rigging: masts, therefore, they had not.

Their arrows were invariably *three feet in length*, as if *by law*. The bows were rough, but strong and serviceable. They were not intimidated by firearms, excepting the first single canoe which visited us, probably to report. They even came on board by the quarters without invitation, although they could not be persuaded to come alongside to traffic. This evinced some little knowledge of war tactics. We noticed that in their approach they observed a very ceremonious distance and pace in passing the broadside, but on completing the circuit as far as the quarter, pulled up for the stern. They were evidently aware of the use of the ports, as well as the destructive engines concealed within, and that the quarter was the weakest point.

In their traffic they evinced more than usual knowledge of useful articles, and plainly intimated that knives or cloth must be the trading medium. We obtained but little from them in return, but

bows, arrows, a few birds of paradise, and bananas.

The head costume differs from those previously seen. The hair is well combed, and drawn through ornamented tubes of bamboo, about one inch and a half in diameter by four in length. In one instance a very fine well-featured lad, apparently a dandy in his way, had five of these ornaments, although they were seldom observed with more than two. A peculiar comb, like a toasting fork, having a pendant at its extremity, is stuck in the coronal tuft, and projects in front about two feet, standing, when the body and head is erect, about ten inches above the line of the eyebrows.

They were apparently under control of a chief who was present, though we could not ascertain which was he. They were very good-tempered, and anxious that we should visit their towns. In build, manners, &c., they were of a superior cast; the features of some of them, particularly those from eighteen to twenty-five, being remarkably handsome, and of a light copper colour. The elders were fine healthy pleasant featured and vigorous men. Apparently, they were above cunning, and were quite independent in their manner. They have evidently been accustomed to visits from Europeans; as they displayed iron, steel, and cloths, and perfectly comprehended that our colours were English.

About two o'clock, the tide having changed, and

brought a breeze from S.E., we weighed, and steered through the passage between the western low island and Jobie, the water deepening as we entered the channel (which is about three miles wide) to thirty-six fathoms.

Having hauled to the westward for the night, we were visited by heavy rain, thunder, and lightning, which lasted until daylight, when I transferred myself to the Starling, in order to seek for convenient anchorage, as well as a good position for rating the chronometers.

Fortunately we picked up a very snug berth, in time to save our observations, and fixed upon a detached limestone clump, half a mile from the main island, completely adapted for our magnetic observations. The ship anchored within hail, in nineteen fathoms, tough clay.

The size and detached position of our rock prevented the chance of molestation from visitors, as not more than ourselves and instruments could find footing.

The natives came off to the vicinity of our position, but giving them to understand that we could not have any communication with them, they quietly retired to the nearest beach, apparently awaiting our pleasure. At sunset, finding that we still remained in the same mood, they retired.

The canoes of this party, which I shall term "state canoes," and which were probably only intended for the inner waters, differed essentially

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from those seen the day before. These were of two kinds, one intended for extensive fishing, and with trifling ornament; the other entirely state, and gorgeously ornamented in sculpture at the stern, which was further decorated by plumes of birds of paradise. This latter had a kind of frame work, which could be immediately converted into a house, by mats there in readiness, and I am inclined to believe they generally sleep in them in preference to landing.

We landed on the day following at the beach, where they had remained, and examined the woods in the immediate neighbourhood. We noticed several very peculiar piles of earth and leaves resembling tumuli, but were unable to trace their purpose.

Having completed our suite of observations, I determined, during our delay for rating the chronometers, to take advantage of the interval to correct this almost unknown region, and with our reduced force, we commenced the survey.

In the progress of this duty, which lasted about a week, and extended over eighty miles of longitude, we found the island which the natives pronounce Jobie, cut into deep creeks, and at twenty miles west of our rating position, formed into numerous harbours by a very extensive archipelago. In the interior, bays were observed, and several very large towns built on posts as before described, but much higher, and apparently so combined as to present a formidable defence to an attacking party. Many

of the interior spots were cultivated, and the plantains and other trees we observed, showed them to be well supplied. Owing to their being warned off by a musket fired over them to prevent their stealing our marks, we had little or no communication with them, although several which visited the Starling at one of the out positions, gave them to understand that hogs, fruit, and the potatoe yam (of the Feejees) were abundant.

Amongst the feathered tribe a very trifling addition was made to our collection, probably owing to our not having sufficient leisure to penetrate into the interior, but a very beautiful cream-coloured pigeon,* was very abundant. A very curious species of a bat or flying fox, parroquets, &c., were innumerable, but difficult to obtain, as they maintained their perch on the loftiest trees, nearly on the summits of the island.

Amongst the trees, several kinds of nutmeg were found, and these appear to abound on the main island, if we may judge from the roosting places of the pigeons, the ground beneath which was literally covered with the nuts which they had voided, as they merely feed on the outer fleshy covering. All the islands are thickly wooded, and afford excellent fuel. The Tamanu, ebony, and other hard cabinet woods, were noticed; the lance wood of the South Seas (Casuarina equisetifolia) we cut for firewood, handspikes, and many useful purposes.

* The nutmeg pigeon.

The reefs which generally belt these islands are well stocked with a great variety of shell-fish, some well worthy the attention of the naturalist.

During our detention in this region, scarcely a day passed without a copious fall of rain, at times almost a deluge. The daily breezes were irregular, frequently from the south-west; and the scud aloft generally travelled from that point.

On the 16th August, having completed the rating of our chronometers, we recommenced our voyage, but were again teazed by our old enemies, calms, variables, and rain, which prevented our making more than twenty or thirty miles a-day. I fully expected that on clearing the high lands of Jobie, the customary trades, or sea-breezes, might reach us. In this we were disappointed, until passing what we took to be the island of Bultige.

On the 21st we arrived at the termination of this group, forming a complete cluster of twenty-two small islets, rising from the same rocky flat, and probably at spring-tides nearly dry. As the Starling lost the breeze before reaching the passage, I determined on attempting a final suite of observations at these islands, but after landing and waiting a considerable time, rain entirely frustrated our endeavours.

It is a curious fact, that from the time of passing Yamna, until the present, not the slightest swell has been perceptible, the ripples on the weather sides of reefs not even endangering the bottoms of our light boats: a perfect still water has prevailed.

On the 22nd, we passed on the eastern side of Long Island of Maclure, our position by latitude and bearing of Mysory proving his survey *relatively* correct, but about thirty miles of longitude in error. Several deep indentations presented themselves in Long Island, and I have little doubt but good harbours would be found within; but no traces of inhabitants were discernible, although Maclure places a village where we must have noticed it, had it at present existed. It is probably deserted.

On the morning of 23rd the mainland of New Guinea was ahead, and with a light breeze we shaped our course for "the Beehive," then in sight, hoping to reach Goelvinks Bay before sunset; but with such imperfect charts, this could only be at a guess.

At noon, our longitude placed us exactly at its entrance, but it was evident from our distance from the Beehive, that it was still at least twenty miles further to the westward.

About four o'clock, we passed its probable situation, but as no convenient opening presented, and nothing which I could at all assimilate to the description of Goelvinks Bay, I passed on, hoping to meet with some favourable position. In this I was entirely disappointed, and therefore made up my mind to terminate my observations on this coast at the island of Amsterdam, its position having already been determined by chronometers from Point Pigot, as well as Amboyna.

The features of New Guinea now resumed their bold outline, which failed about Yamna; and "Trees Cape," (which certainly deserves a better name, and was mistaken for Cape Good Hope,) was passed on the evening of the 24th.

We then found that another low cape showed on the same bearing, which being more westerly, could be no other than Cape Good Hope.

During our run along the last forty miles of coast, and not more than two miles from the shore, but three villages were noticed, and no disposition evinced to put off in their canoes. Indeed, but one or two natives were observed, the remainder, probably from fear, or employment, being absent in the mountains, from whence many columns of smoke were observed to issue.

On the morning of the 23rd, we had neared the islands of Amsterdam and Middleburg, sufficiently to proceed in the boats, the wind having nearly failed. We first directed our course towards the northern sandy point of Amsterdam, but on nearing it, found it to be dead low water, with a heavy surf setting on a rocky barrier, which prevented access. Contrary, however, to the description, we found the soundings regular, as the bottom could be plainly traced from a cable's length from the breakers.

On rounding the eastern end by the channel between the islands, we found safe and convenient landing on a clear sandy beach, within the eastern

point of Amsterdam. The channel between the islands is safe, and instead of seventeen or eighteen *feet*, read seventeen or eighteen *fathoms*.

After completing a suite of magnetic as well as astronomical observations, and surveying the two islands, we bore up at sunset for Point Pigot, the evening terminating with thunder, lightning, and rain.

We have observed, that in the mornings before sunrise all the outlines of the mountains and distant land are beautifully distinct and free from haze. As the sun rises, vapour is generated, and they become less distinct. By nine o'clock clouds form over the mountainous peaks, and shortly cap them; thunder (which, by-the-bye, is almost incessant) is distinctly heard. By four o'clock the clouds have accumulated into a dense black mass; and from this time until eight P.M., they pour down their contents at intervals, with unsparing volume. About eight the clouds suddenly disperse, and the spangled arch is free even from scud.

It is also a curious fact, that before the clouds exhibit any apparent discharge of rain, small white vapours resembling steam-clouds arise from the valleys and woods, and mingle with the black mass gathering above them, becoming more dense, and increasing in rapidity, as they approach near the clouds.

This, doubtless, results from the sudden condensation of the vapour arising from the earth, pre-

viously heated by the sun's rays. Yet this latter phenomenon is more frequently observed, and in greater volume, after long continued rain, at the moment of clearing off, although no sun is visible. At New Ireland it was *perpetual*, and resembled smoke issuing from the forests.

In these regions one may therefore calculate on a sound drenching once every twenty-four hours, if within twenty miles of high land.

Nothing of interest occurred at these islands. They are mere coral patches, having about ten feet soil above the sea level, and are well clothed with tall trees, similar to the main island. The natives came off in their canoes to the Starling, and one uncouth Noah's ark went off to the ship, but did not communicate.

In the account of these islands, they are described as two low flat islands surrounded by a reef, and about two or two and a half leagues from the coast; the reef projecting from Amsterdam, "*steep to*," having fifty fathoms near, and four or five feet on it in some places.

From our examination it will appear that these islands are distinctly separate, the depth between them ranging gradually from five to thirty-five fathoms mid channel; that the soundings approaching them are regular from one hundred fathoms from the reef; and that in a south-east direction from the eastern sandy point of Amsterdam, good tough holding ground, in mud, may be found from twenty

to thirty fathoms. The Starling anchored in twenty-eight fathoms mud, 2′,7 miles from the point.

The inner point of Middleburg is more than two miles from the coast.

Wood for fuel is plentiful, and tamanu of large size overhangs the water.

On the morning of the 26th, we found ourselves at the mouth of Dampier's Strait, but the breeze proving light, did not succeed in getting abreast of Point Pigot before eight in the evening. Our noon position showed the charts to be defective, the whole eastern side of Waygiou forming a deep and extensive bay, and our latitude being much to the southward of Point Pigot, although its island bore to the southward of west from us. With respect to the current also, we were much disappointed, not having experienced its action during the whole day.

We noticed an extensive line of sand banks between Point Pigot and the south-eastern point of Waygiou, which, although of interest to the surveyor, are too close in to cause uneasiness to the navigator.

About eight P. M., we took a fine breeze from S. S. E., which helped us for a few hours, carrying us past the islands off Cape Pigot. At four in the morning we found ourselves close to two low islands, and as I conjectured them to be the "Foul Islands," the ship was tacked until daylight, when my suspicions were confirmed. We had no sound-

ings, with one hundred fathoms, but could hear the surf sound very distinctly. The line of current was now very distinctly apparent on the surface, and with a light air from south-east, we edged over for Pigeon Island, for the purpose of fixing one decided position in this strait, as well as to obtain the exact time of high water; this being the change of the moon. The stream anchor was dropped, and means taken to avail ourselves of every advantage during our necessary delay.

Our observations having been completed, and a rough survey made, we embarked about three, when the anchor was weighed, but the flood-tide having made too strong for the breeze, compelled us to anchor again until slack water.

Our observations disagree very materially with the charts. The relative position of the islands is also very erroneous, our rough survey having narrowed the channel several miles.

Pigeon Island is a mere strip of land, surrounded by a coral ledge. Landing is easily effected at half-tide, on the S.W. point: but at low water, springs, the waterline shows a steep coral belt, having some inches water within, over sand and coral, for a cable's length.

The island is pretty well wooded, the whole of the S.W. point alluded to abounds with the Casuarina equisetifolia, or Ito of Sandwich Islands, Tahiti, &c., or commonly termed "iron-wood." It is difficult to cut when of large growth, and dry; but in its green

state not more so than other hard woods. It forms excellent fuel, and does not ferment in the hold, an evil to be cautiously avoided in tropical regions: I strongly suspect the mangrove, and I placed great faith in keeping my ship clear from fever on the coast of Africa, by never admitting green wood, or that with the bark moist.

We found it low water precisely at noon, and from the rapidity with which the tide flowed, as well as the current slackening off, I presume that it was high water about six P. M. At ten the breeze enabled us to weigh, and after our usual dose of rain, and et ceteras, we cleared the straits in the morning.

During our detention we were visited by several canoes, and one state canoe, having on board a person styling himself Captain of Gibbie, probably the island of Geby, or Ghibi, of the charts. He was well attired in oriental costume, spoke English tolerably, and informed us that in one moon, many ships of several nations would visit his island. He was very anxious that the ship should proceed there, where she would obtain supplies of vegetables and fruit.

During my conversation with this individual, I was rather surprised to hear him designate his people Papoos, and upon my questioning him whether they belonged to New Guinea, he explained that the lower order of Ghibi, Băttăntá, and others, were designated Papoos, but which had no connexion with the "Great Island" of New Guinea. I have since been informed that they are of the same race.

S. Buzz

Prahu of Tidor

The vessel in which this person came was one of the regularly *built* prahus, or prau, (not a canoe,) but furnished with outriggers, and stages for those working the oars. She carried banners, and assumed some little state. Her stem was precisely in the Spanish, Portuguese, and Italian style—rising high, with a nob. We had some difficulty, at first, in dealing with this person, who was either unwilling to trade, or waiting for a present. We succeeded in obtaining several very handsome lories alive, and a few birds of paradise, mats, &c. He did not consider the fine season as set in until next moon. His "fine season" probably reckoned by the number of whale-ships and visitors who take this route in the S.W. monsoon.

A fine breeze led us up to the island of Pulo Popa, which we cleared after a short tack. The Full and Change, hitherto, has been attended with rain and unsettled weather at this season, which the last twenty-four hours has fully corroborated.

On the morning of the 28th August, as the rain cleared off, we found ourselves close off the coast of Cēram. Nothing could surpass the beauty of the scenery, and now, for the first time for many months, we beheld clear spots of park land, studded with a moderate proportion of trees. Of late nothing but the sombre sameness of dingy forest had met the eye, and gradation of shade, betwixt hill and ravine, afforded the only variation in the landscape. Here we had not only the varied yellow, brown, or green, of the clear lands or meadows, but every other forest tint; above

which beetling peaks, with their white weather-worn lines, occasionally peeped through the misty clouds, which but a few hours since had entirely eclipsed them, and shortly floated over their summits, merely to add fresh spirit to the scenery by their shadows. There is something more than ordinarily interesting in the rapid changes of scenery which the seaman witnesses; point after point opening and displaying bays, harbours, huts, natives, &c.

We had now, however, arrived within the range of civilization, and the sight of a vessel was *an occurrence too ordinary* to cause any of the natives to visit us in their canoes. Having reached within two miles of the beach, we took the fresh trade, or probably sea-breeze, which by sunset carried us well clear of the Island of Ceram, (pronounced Cēē-răm.)

As it was important to reach the nearest port, in order to save the meridian distance, I determined to stand on for Cajeli Bay, Bouro, and therefore signalled the Starling "to make the best of her way to Amboina," where she would prepare the governor for my arrival, and remove the difficulty of obtaining immediate observations.

At daylight we were well in with the island of Bouro, but too far to the southward. Horsburgh's directions are not sufficiently explicit for finding Cajeli Bay. He should have explained that "Mother and Daughter," (the latter might have been omitted, as only seen when well into the depth of the bay,) are two very high conical hills *inland*, which from

the sea appear as one. The eastern side is streaked white, by reason of its bare rocks. It lies on the S.E. side of the depth of Cajeli Bay, and is an excellent mark for rounding the eastern head, from the S. E. As long as its head can be seen above the trees at the eastern point, the ship will be perfectly clear of danger. The instant it begins to *rise*, after passing the point, a course may be shaped for the north point, which apparently shows as the left of an island on the N.W. shore. When mid-channel, steer with the town off the larboard cathead, until Mother bears S. E. by S. Then steer south for the fort; shorten sail about one mile from it, and anchor at the first cast twenty-five, bottom mud, and good holding ground.

The limit of danger, westerly, is the two eastern turrets of the fort in line. We found soundings in every part of the bay, both going in and coming out; on the latter occasion, it never exceeded fifty fathoms, until we hauled up E.N.E. Entering, it ranged from sixty-two, forty-two, and sixty, gravel. It frequently falls to our fate to enter ports at night, and on this occasion we did not reach our anchorage until three A.M., on the 31st., in twenty-five fathoms. Fort south, Red Island East.

I paid a visit to the "resident," who was rather surprised at a visit from a British man-of-war, without the customary notice from the governor of the Moluccas. Indeed, he scarcely comprehended

the difference between a ship of war and a merchantman, and could not be made to comprehend that our visit was merely to look at "*his sun, moon, and stars.*"

CHAPTER IV.

Amboina—Flattering reception by the governor—The rajahs—Visit a cavern—Mode of travelling—Grotesque attendants—Society—Fishing trammels—Chinese town—Garrison—Capabilities and government of the island—Return to Bouro—Cajeli Bay examined—Passage to Celebes, Macassar—Fort—Situation of the Dutch—Solombo—Pulo Kumpal—Singapore—Receive orders to proceed to China—Prosperous state of Singapore—Palawan passage—Starling struck by lightning—Manila—Transports with invalids—Indisposition of the authorities towards them—Join the squadron at Chuenpee.

CHAPTER IV.

About four o'clock on the 1st of September, having completed our observations, we quitted Cajeli Bay for Amboina. The current at ebb sets very strong to the southward, so that, by keeping in the strength of the stream during the night, we found ourselves well to windward of the island of Amblau by daylight.

At dawn on the 3rd, we were close off Noessaniva Point, and, favoured with a light easterly breeze, we soon rejoined the Starling, and found two Dutch Company's brigs at anchor within. We dropped anchor close to the westernmost, in twenty fathoms. It is customary to run the stream cable to the shore, in case of strong puffs off shore, and for this purpose, heavy anchors are already laid down, to which cables can be attached at low water.

Accompanied by my friend Kellett, I proceeded immediately to call on the governor of the Moluccas, Colonel de Stuers, who resides at a very delightful spot about half a mile from the town. My reception was highly flattering, and was immediately

followed by permission to place my observatory where I pleased, and the requisite orders were immediately issued. After examining the governor's magnificent collection of shells, insects, and other objects of natural history, we took our leave until the dinner hour.

The position selected for our observations was on the S.W. angle of the curtain of Fort Victoria, where a summer house, constructed for taking tea and smoking, very conveniently afforded shelter, without the trouble of erecting tents. Occasionally the passing of the natives jarred the ground slightly; but whether by the order of his excellency, or a proper consideration on the part of the officers, we were entirely free from visitors during the progress of our observations. Those not interested in or comprehending such duties, cannot but feel that we are unwelcome guests whilst we are thus engaged. The inattention to questions, and the perfect abstraction necessary for a portion of time, must appear almost as a slight on their intended courtesy. Yet, if they could but comprehend the value we attach to time, they would clearly feel the propriety of allowing us to enjoy our hermitage.

At six the Governor sent his carriage for us, and we repaired to his beautiful retirement, where we were introduced to Madame de Stuers. Once more we congratulated ourselves on regaining society, from which, excepting a few short moments at Tepic, Sitka, and Lima, we had been almost excluded since 1836.

The governor and Madame both speak English well, and were unremitting in their polite attentions. They are both strongly imbued with the taste for natural history, and appear to enjoy perfect happiness, even in this distant region, by constant application to rational pursuits. They have a fine healthy and beautiful family, consisting of three boys and three girls, the eldest boy being about ten years old. Madame is the daughter of General de Kock, now minister of the interior in Holland, and formerly governor-general at Java, where I believe madame was born. It is, therefore, surprising that she does not, according to the custom of India, give way to the habit of consuming the greater part of the day in the siesta, which I believe to be very enervating. Activity appears to be their motto, and blooming health results.

On their passage hither in a steamer they were wrecked upon the Turtle Islands, near Goonong Apee, not more than a hundred and twenty miles from their destination. There they experienced great hardships, and probably would have perished, had not one of the boats reached Timor or Java, and brought them assistance. Another boat fell into the hands of the pirates, but the crew were eventually recovered by ransom.

At the period of our visit the rajahs from the neighbouring islands had assembled at Amboina, to try their disputes, for which purpose the governor presides in court twice in the year. The court is

composed of the president, assisted by twenty-four rajahs; the cause is heard before them, and the law explained, so that the award is nearly the act of their own body. I was informed that it is a very tedious operation to make them understand the *law*, or be convinced (probably against their will) of its infallibility. After the third day, on which the business terminated, the governor, according to custom, gave the rajahs an entertainment, to which my officers and self were invited. I fully expected to have seen all the rajahs in splendid costumes, but the greater part of them were dressed as Europeans, and had nothing in particular to distinguish them from the general residents. After dinner their healths were drunk, and "success to their clove plantations."

The governor was kind enough to make a party the following morning to visit a cavern in the mountains, as well as afford us a sample of the style in which he travels in these regions. At six o'clock his carriage conveyed us to his house, where a host of natives with open palanquins were assembled. During the delay of taking coffee, a band of seven grotesquely dressed men, with swords and shields, birds'-head helmets, adorned with the feathers of the cock, or birds of paradise, (very much in the merry-andrew style observed at our fairs in England,) danced to the sound of a drum and gong, keeping excellent time, and imitating the attack and defence of war parties; intimating that your ad-

vance was opposed until their ceremony or mode of salute was complete.

Having mounted our palanquins, to each of which twelve bearers were appointed, the band and dancers, preceded by two Dutch ensigns, led the way. Our journey lay over very slippery ground, it having rained hard all the preceding night, and some of the steeps were so very rugged, that one could with difficulty keep his seat in the palanquin. Some of the party got out and walked, an example which I felt much inclined to follow, but as the governor remained seated, I considered it etiquette to maintain my state, even at the risk of my bones.

At every hundred yards, or probably at such intervals as the leader of the band considered the bearers out of wind, the dancing guard obstructed our progress until their fantastic ceremony was complete.

We enjoyed several very beautiful prospects from the heights, which probably would have been still more brilliant had the sun favoured us. But we could well spare his presence, and enjoyed the cool fresh air resulting from the late showers infinitely more than the steam heat which his rays would inevitably have produced.

About half-past seven we reached the mouth of the cavern, which the rajah of the district had already prepared for our entry, by a range of stakes forming steps down the first steep descent. The depth was not great, nor from the nature of the

soil was there much stalactitic concretion. Bats were numerous, as well as crustaceous spiders, and crickets of a curious kind. The swallows which construct the *nidi esculenti*, or edible birds' nests, were here uninterrupted. I obtained one, however, as a specimen, but it had but little of the glutinous matter with which it is attached to the sides or roof of the cavern. At the extremity of the cave we found a marble tablet noting the visit of Captain D'Urville, commanding the expedition of the Astrolabe and Zelée, which was placed there by the fiscal or chief magistrate.

Our return was much in the same style ; when, having breakfasted at the governor's, we returned to the ship. In the evening we rejoined the governor's party at a ball, where we saw all the youth and beauty of the colony, and waltzing and quadrilles were maintained with great spirit until a late hour. With the exception of four or five, all the young ladies were born of native mothers, or of native extraction, in the colony. Of the whole collection not an ordinary face was visible ; all were pretty, several very handsome.

The attentions of our kind host and hostess were unremitting. Indeed, from the moment of arrival until we took our final leave, hardly an hour elapsed without increasing our debt of gratitude. All our establishment have felt the kindness of our warm-hearted friends at Amboina, and I am satisfied will

not easily forget them. Deprived of society for such a period, it has been to us quite a paradise.

The roads in the neighbourhood of the town are in admirable order, and afford several very pleasant rides. I accompanied the governor to examine one of their fishing trammels at his sea-side cottage, which is situated about two miles from the fort. The manner of construction is ingenious. Stakes are driven into the ground in the figure of a broad arrow, the barbs incurved to half their length.

The apex is formed similar to a mouse-trap. This is surmounted by three others; that outside being the preserve. All the barbs are fitted with hinges, by which the angular aperture can be closed at the pleasure of the person on watch, who generally lives on the stage in "Jack-straw's house." The outer preserve is generally in three fathoms water, and the upper frame-work weighted with stones to prevent its rising. All the walls are even, constructed of slight bamboo, with half-inch openings.

To take the fish, the outer doors are all secured; a diver descends with a landing net, and first frightens the fish from the bottom. Then looking upwards, as his buoyancy causes him to ascend easily, he dexterously uses his net to take those at the surface, which are completely bewildered.

The horses in use here are small, but well-limbed, and very strong. The governor was kind enough to send his carriage for us on all occasions, and

although the little animals were not taller than Scotch ponies, they carried four inside and three servants outside at a rapid rate.

The town of Amboina contains a large number of Chinese, who reside principally in the western quarter, where a very large and well stocked market furnishes most of the luxuries as well as the necessaries of this climate. The race, however, do not appear to maintain the high character they have for industry in other parts of the world; possibly the laws restrain them from indulging in such speculations as they would prefer. I was rather disappointed, therefore, in not finding their shops well stored, forgetting their limited communication with their own country.

Amboina is garrisoned by companies, partly Dutch partly Malay, commanded by a lieutenant-colonel, who keeps them actively drilled every morning at six, and frequently in the evenings. Their appearance speaks for their health. In the evening the officers amuse themselves at the club with billiards, cards, &c. They are required to serve a certain number of years before they are entitled to a pension, and no officer is permitted to marry, unless he can give security that himself and his intended possess enough to maintain them respectably.

The brig of war mounts twenty thirty-two pounders, upon very small tonnage, but appears to be kept in very creditable kelter. The European part of her crew are preserved from undue exposure by part comple-

ment of Malays, who perform wooding, watering, and other heavy duties, similar to our Krou-men on the coast of Africa. Our officers received much attention from the army and navy; indeed, from the governor downwards we were to all deeply indebted.

The governor having accepted an invitation to a second breakfast, accompanied me in my gig, in full uniform; the Starling having been ordered to hoist the Dutch national colours, fired the necessary salutes to the flag, as well as personal salute. His own state barge, however, was in waiting, a splendid kind of "city barge," manned by Malays, and decorated with three large Dutch ensigns. The lieutenant-colonel, chief magistrate, suite, &c., came off in her.

Owing to the tie of observations, chronometers, &c., I was unable to spare time to visit the clove gardens, or make any protracted excursion into the country, which was several times proposed by my kind friend, the governor. The nutmeg trees are very common, and produce abundantly, but the fruit is inferior to that of Banda, not yielding the same quantity of oil, which in the Chinese market is important. The natives manufacture various ornamental articles, as work-boxes, urns, prahus, &c., from the clove; and the native-born young ladies occupy their leisure hours in making fancy flowers from the feathers of the numerous parroquets, lories, and other gaudy-plumaged birds with which these islands abound.

Amboina, although not yielding plentifully from its

own harbour, is the nucleus where the shells from the Moluccas are usually assembled, and where they generally find a good market. The islands of Cēram and Goram appear to contribute not only largely, but also the greater number of rare shells. The island of Amboina itself presents one of nature's freaks, being almost divided at its northern end. At one period the Dutch attempted to cut a passage through, and in part succeeded. This has been partially filled up, although I am given to understand that at present the large prahus are floated and carried across, so as to prevent the necessity of going out by Noessaniva, when bound to Ceram.

The Dutch maintain their sway over the island of Ceram; have forts established on it; and by the ceremony before alluded to, viz. the biennial visit to decide their legal differences before the governor at Amboina, the natives distinctly acknowledge their supremacy. Gillolo, Ternate, and Tidore, are subject to the Sultan of Tidore, who, I am given to understand, is in turn, either subject to, or under more than close alliance with, the Dutch government. All these islands, including the Banda group, Manada, (on Celebes,) Mindanao, Oby Major, and a few settlements on the shores of New Guinea, are under the authority and surveillance of the governor of the Molluccas, who usually makes his annual tour of inspection, when I understand he is well received. Indeed, we ourselves witnessed the attachment expressed by those assembled here.

According to custom in all semi-civilized nations, wherever food is spontaneously produced, there is but little disposition to labour. The sago-tree, which at Amboina, Bouro, Ceram, and adjacent islands, grows must luxuriantly and attains a large size, (eighteen inches diameter,) is calculated to subsist a family for one month, or even six weeks. The tree being felled, is secured in a horizontal position, and an opening being cut on its upper surface, the centre, which is about eight-tenths of the capacity, is scooped out as required.

Plantations, gardens, &c., flourish; and nothing but the desire of gain, or of being in a condition to assume the European garb, can excite the natives to labour. The cultivation of the patches awarded by government is kept up by a kind of tax on tenure, and these are guaranteed by responsible rajahs.

Amongst the many presents constantly arriving from my kind friend, I cannot omit to mention that important addition to our zoological collection, the Babyroussa hog; which, from its docility and having been reared from young, promised to see England safe; unless indeed poisoned by eating anything that fell in his way amongst his epicurean researches. Six lories, and as many marine's *shoulder and cap scales*, (of brass,) did not in the least impede digestion. He eventually reached England, and I believe is now *happy* in the Zoological Gardens.

Having completed our necessary refit, &c., we took leave of our kind friends at Amboina on the

13th of September, and directed our course for Bouro, to take a fresh departure, as well as obtain a sea-rate for our chronometers from our absolute meridian. I was anxious also to examine the dangers of Cajeli Bay, and either dispel them, or put them into some tangible form on paper.

On the night following (about two A. M.) I anchored in the bay, much to the surprise of our Dutch friend "the resident," (a clerk,) who I believe thought us little better than mad. During the interval occupied in obtaining our necessary observations, a fair survey of the bay was completed, certainly outlining the important danger line, to vessels wishing to visit the bay. On the 16th we quitted Cajeli Bay, and hauled to the southward, in preference to risking the calms which generally prevail at this season on the northern or lee side of Bouro.*

Bouro, or Cajeli Bay, possesses great advantages over Amboina, as regards supplies of poultry, eggs, water, and wood. The harbour also is snug and safe, sheltered from the monsoons, and less troubled with the diurnal rains of Amboina, consequently better adapted for casual refit, as well as astronomical observations. As regards natural history also, it affords a wider field, particularly in conchology. The famed Babyroussa hog abounds on this island, although very difficult to obtain. Deer are plentiful in the interior, and birds unknown to the Dutch residents are frequently spoken of by the natives.

* Also spelt Boeroa.

A great variety of very beautiful woods, adapted for cabinet purposes, are also plentiful, including perhaps the most valuable ebony of these seas. I was informed, however, at Amboina, that the ports of Ceram completely eclipse Cajeli Bay in point of natural history, and the fancy woods generally.

The Cajeput oil, I believe, is principally obtained from this island, and sent to Amboina. That obtained here was superior to any offered for sale at the latter.*

The morning after our departure from Bouro found us well to the southward, aided by the prevailing currents, now nearly at the springs. Our hopes of a speedy passage were, however, baffled by light airs; and dreading calms in the Boreton passage, I determined on hauling to the southward of the group of Token Bessy, sighting Velthoen, and correcting, if necessary, the positions of any of the islands.

On the 21st of September we passed Velthoens, after having been somewhat puzzled at the islands which surrounded us. Unfortunately the weather was too hazy to test Velthoens, but the next day at noon, satisfied me that some of them should take a more northerly place on the chart. We passed through very strong ripples and overfalls, but could not obtain soundings.

From the 17th until the 20th, a heavy misty

* It has the faculty of rendering paper transparent or opaque at pleasure.

oppressive atmosphere surrounded us, preventing our effecting any of the objects which I had contemplated on pursuing this course.

On the night of the 19th of September we had the misfortune to lose our gunner (Mr. W. Holder) from dysentery contracted at Tahiti, and which had obstinately hung upon him since. He was an old shipmate of mine (as a boy) in 1819, was deservedly a favourite with every one, and much regretted as a public loss.

Having cleared the Token Bessy group, a course was steered to sight the Tiger Islands, situated to S.E. of the island of Salayer. At noon on the 20th of September we were within *four miles* of the position assigned to the easternmost, and before sunset had run over *two more* without the slightest indication of land. They are therefore justly placed "*doubtful*" on the charts. Had our position at noon admitted of doubt, I might have been inclined to attribute something to current, but this was out of the question on the course steered, as we reached the mouth of Salayer Strait by daylight, experiencing a north-westerly current. Indeed, at dawn we found we had been literally driven through the strait by the current, then setting west.

About eight on the 24th of September, we perceived the Dutch colours flying on the fort at Boele Comba, (on the southern coast of Celebes,) and as this position might assist vessels in correcting their longitudes, I despatched the Starling to secure its

position, make a rough survey of the road, and rejoin me at Macassar.

Pursuing our course westerly, we passed the Bay of Bonthian, (celebrated for the unhandsome treatment of poor Carteret,) rounded point Layken by sunset, and shaping our course between Celebes and the island of Tanakeke, passed through this strait about eight o'clock, when we anchored for the night in eighteen fathoms. On weighing at dawn, we found we had far overshot our distance.

About ten o'clock we discerned a Dutch frigate, and the forts and town of Macassar; but as the plans supplied differed by exactly *double their scales*, I deemed it prudent to incur expense rather than risk her Majesty's ship. I therefore made the signal for a pilot, but as he was long in getting out, we found ourselves within the harbour, and at anchor, before he reached us.

The frigate we found to be the Rotterdam, her captain having immediately despatched one of his officers with offers of assistance, and to pay the customary compliments. The visit I returned without delay, and accompanied her captain to pay my respects to the governor. The customary ceremonies over, and the necessary sanction obtained, our observatory was pitched nearly on the spot occupied by the French expedition in the Astrolabe and Zelée.

From the imperfect state of the charts, I deemed it necessary to make the most of our detention, by resurveying the dangers, channels, &c., on the approach to this anchorage.

On the day following I accepted an invitation to a parting dinner given to the captain and officers of the Rotterdam, which passed off pleasantly, by dancing until midnight. Our labours having terminated on the 30th, we took our departure on the 1st of October for Great Solombo and Singapore; the Rotterdam having sailed on the 29th for Batavia.

The civilities offered to myself and officers at this port left no weight of obligation on our minds. With the exception of the chief magistrate, who offered me every assistance, I had no acquaintance.

The fort of Macassar stands on the S.W. angle of the town, disconnected by a ditch and high rampart, within the walls of which reside the military, amounting in all to about three hundred, inclusive of a squadron of cavalry.

The town, which is walled, is very regularly built, extending about one quarter of a mile by half a mile on its squares, and having three gates on its southern face, which are closed at nine o'clock. The Chinese appear to constitute the majority of the population within the town; but the huts of the natives extend considerably to the northward, and appear to be very thickly inhabited. All the coast-line displays a large proportion of population, and the small islands also are not deficient in this respect. They are probably fishermen. Indeed the approaches from seaward afford very strong testimony to the piscatory pursuits of the natives; their

beacons, which were frequently found in sixteen and seventeen fathoms, inducing a belief in shoal water, and thus causing an alteration of our course to thread them. The canoes are also very numerous.

Although the Dutch have so long held possession of Macassar, their position does not appear free from alarm, the natives not unfrequently giving them cause for vigilance. We had frequent opportunities of noticing the variety of castes, which generally loitered about the observatory, in their passage through the fort. In some instances, the higher

NATIVE OF BUGIS.

classes were very superior in figure, attitude, carriage, and complexion. The lower orders, on the

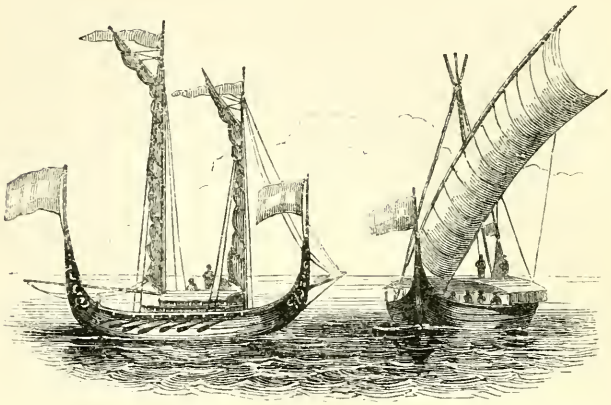
Native Women of Celebes

contrary, are generally undersized, ill-looking, moody, and might easily have been stirred into brutality. Even the higher grades assumed a sulky, suspicious air, which was anything but prepossessing, and they appeared at all times ready for mischief. But I never failed in making them throw off their ill-humour when I wished to communicate. They were even excessively polite in their manner.

None go unarmed; generally they carry the kris, and those of rank are followed by an attendant with a silver-mounted hunting-spear. Their costume is Arabic, their religion Mahomedan. The port appears to possess an extensive coasting trade, if one may judge from the numerous large prahus at anchor and on the move; but I am informed that their exports will not cover the specie they require for the purchase of European commodities.

The position of Macassar is reckoned particularly salubrious. The atmosphere is very dry, and, unlike any of the positions we have lately visited, we found it entirely free from rain during our visit. I am told that it seldom rains, and is very similar to the climate of Lima. Nevertheless the horizon and atmosphere on the mountains is very hazy. The sea-breeze generally sets in regularly about ten o'clock, commencing from the southward, and veers to the westward before sunset, when it fails, and is succeeded about ten o'clock by a cool land-breeze. The thermometer ranged during our visit from 74° to 94°. Stock is plentiful and reasonable,

as well as vegetables; but no table requisites or wines are to be procured. Their prahus are peculiar.



PRAHUS OF MACASSAR.

Quitting Macassar, our course was directed to pass to the northward of the Northern Brother, crossing the Tanakeke ledge, on which the chart gives nothing less than nine fathoms. About eight P. M., in heavy ripplings, we shoaled to four and a half fathoms, when we tacked, and stood to the eastward, anchoring in five fathoms. The current set very strong to the W.N.W., and the boats sent to sound, reporting nothing under four, we again tripped, and shortly deepened to thirteen fathoms, By daylight this would have been of little importance, but the dangers of the region being almost unknown, and heavy overfalls surrounding us, our situation was anything but pleasant.

On the 3rd of October, we made the island of Solombo, but were unable to reach our anchorage

before dark. After rounding the S.W. angle, and coming suddenly into eight fathoms, I hauled to the southward, to determine the range of soundings, and gradually edged in, letting go our anchor in ten fathoms. Daylight showed that our usual good fortune attended us, as had we stood on half a mile further, we certainly would have been too near to be pleasant.

In the morning we succeeded in landing, to save the astronomical observations for time, and having obtained our suite of magnetic observations, I found the officers, with their boat's crews, engaged hunting wild buffalo. The reports of muskets were frequent, but, although one was badly wounded, our sportsmen did not reward us by the sight of a carcass. Up a small valley near the southern point, our men noticed a small fresh-water lake, apparently staked, which would lead one to infer that there were natives or sojourners concealed. However, we did not perceive even a trace of a footstep on the sands, nor anything resembling habitations or their ruins. The mysterious piles, indicating the work of human beings, as noticed in every island within the New Guinea range, were numerous.

The composition of the island appears to be volcanic, belted, as usual, by compact coral limestone, through which the black amygdaloidal rocks protrude. The island is well wooded, and has a crowned elevation with two cones (about three hundred feet above the sea level) near its southern extremity. Landing is easily effected at high water,

but not without wet feet or even wading, nearer than half a mile from our place of observation, at low water. It is probable that better landing may be found in the bay immediately within the south point, but neither time nor duties admitted of determining this question, or even how far it might be practicable to water. We were released by the flowing tide, just before sunset, and having completed our observations, weighed and pursued our voyage, steering for the Mancap shoals off the south-west extremity of the island of Borneo, hoping to be able to meet with some position for a magnetic station in that neighbourhood.

On the morning of the 7th of October, we rounded the shoals of Pulo Mancap, but being then in seven fathoms, and no island near, I determined on running for Pulo Kumpal, (Rendezvous Island;) and with a favourable breeze reached the anchorage within one mile of the point selected for observing, by noon. This is considerably nearer as well as much safer anchorage than the charts admit. The Starling afterwards took up her position within one eighth of a mile, but had rocky bottom.

No time was lost in selecting our position and landing our instruments, nor did the island offer any inducement to expend time in making any very critical examination, beyond the composition of our immediate location, (as regarded magnetic disturbance,) which was found to be a mixture of contorted slaty and sandy schistus, traversed by veins of quartz,

the general mass having apparently undergone volcanic action. It had not the slightest effect on the needles, although the slaggy edges apparently offered traces of iron.

Having completed our observations, and a simple survey of the anchorage and outlines of the neighbouring islands, we took our departure at sunset, October 8th, shaping our course for the Carimata group. Light variable winds prevailed. On the 9th, we passed the southern Carimata. On the 14th, made Bintang, and about eight P. M., on the 15th, passed to the northward of Pedro Branca, where, the wind and tide proving adverse, we dropped anchor until daylight, when we resumed our course for Singapore, and reached that port about nine A. M. on the 16th. Having been visited by the master attendant, I called on the governor, Mr. Bonham, who was excessively civil; and as our observations and occupations did not admit of disturbance, he allotted me the recorder's house, where Captain D'Urville had preceded me.

From the utter improbability of our touching at this port on our homeward voyage, I had not the most remote idea of meeting with despatches or letters. To my surprise, however, several official letters were presented to me; and this surprise was not a little increased by one from their lordships, directing me "immediately to retrace my steps and join the commander-in-chief in China." Orders, it appeared, had been transmitted to San Blas, via Mexico, di-

recting me to proceed direct to China, but having quitted previous to their arrival, we had thus lost the first onset of active operations.

I hardly know whether I am safe in saying that pleasure or disappointment prevailed. To those reduced to their last shreds by a five years' absence, I presume that the hopes of home predominated. However, for myself, I could not but feel the compliment intended, and the importance of straining every nerve to satisfy my patrons that, although late in the field, I would do my best. This induced me to put up with many inconveniences, in order to get my ship to sea: but with all our exertions, caulking, refitting, and provisioning, we did not succeed in moving until daylight of the 23rd of October.

The botanical collector of seeds from Kew, conceiving himself out of his sphere in our prospective cruize, requested permission to return to England with his collection. Several invalids were also sent away, whose constitutions could not stand further exposure, as also our Epicurean friend the Baby-roussa hog.

The port of Singapore has been so frequently described, that anything like a history of its march would appear superfluous. Nevertheless, thus much I think may be safely advanced, that under its present worthy and spirited governor, it is making rapid strides in advancement as well as importance. The buildings are all in princely style, and viewed from the sea, will soon contest the title of the City of

Palaces with its more wealthy predecessor. Those who could at this moment view from the Governor's Hill what has been effected, and is now in progress, from marsh to city, would really be astonished at what wealth, perseverance, and bold design can effect.

On the northern side of the stream are situated the private residences of the merchants' (little palaces) public offices, &c., behind which, on a mound rising two hundred feet above the sea, on a fine airy commanding position, stands the dwelling of the governor, as well as the signal station.

To the southward of the river all is commercial, comprehending the warehouses and counting-houses of the merchants, as well as the shops of the numerous Chinese. All is activity, river and streets alive with human beings, and the port, almost too closely, thronged with vessels from every clime.

The nature of our duties, as well as the very short period of sojourn, prevented our seeing much of the residents. To the governor I feel that my able coadjutor Kellett and myself are under considerable obligation for his unremitted kindness during our short stay, as well as his anxiety to further the success of our operations. We had also the pleasure of becoming acquainted with Lieutenant Elliot of the Madras Engineers, in charge of the Magnetic Observatory, and were enabled to compare our instruments with his splendid suite before moving to China.

Previous to our departure, the French frigate Magicienne, Captain Roy, arrived from Brest and Cal-

cutta on her way to Manila and China. I had the pleasure of paying him a visit on board his frigate, and felt regret at so short an acquaintance, and the impossibility, from want of time, to show him the attention which, under other circumstances, I should have been delighted to do.

A light breeze helped us but tardily towards Piedra Branca, or white rock, which serves as the beacon in those straits, and never did light breezes weigh so heavily on us as at this moment. About noon we discovered canvass evidently of our own hue, and shortly after exchanged numbers with Her Majesty's brig Cruizer, Captain Giffard. Knowing him to be direct from the China fleet, our anxiety to learn particulars was very strong. He shortly came on board, and although he had but little to communicate, that little was to the effect that nothing hostile had yet taken place, and that we might yet be in time to share in hostilities.

This served as a fresh spur to lose not a moment in reaching the commander-in-chief. We, therefore, took leave, and hastened on for China. Light airs compelled us to anchor off Piedra Branca until daylight, when we resumed our voyage.

I had already made up my mind, owing to the lateness of the season, to take the Palawan passage, and it so happened that on reaching the offing, the prevailing breezes left us no alternative. We were much worried by heavy rains, squalls, variables, &c., preventing our obtaining the latitude; and had we not

fortunately passed close to Low Island, we should have been much puzzled how to act. During a heavy squall, a kind of whirlwind and whirlpool combined, which barely cleared our flying jib-boom, passed close under our lee without damage.

On the morning of the 28th of October we found ourselves to the S.E. of the great Natuna, with fine weather and light breeze from S.W., enabling us to dry our feathers.

On the evening of the 29th, with breezes varying from E.S.E. to W.S.W., we passed off the bank of soundings, our last depth being in one hundred and ten fathoms. On the night of Saturday, the 7th of November, we experienced a very severe visit of thunder, lightning, and rain. The forked lightning darted around us, and apparently inboard, with awful explosions of thunder, fortunately without wind. At daylight we found that the Starling had her foremast, topmast, and topgallant mast shattered, and three of her crew wounded by the electric fluid.

Every exertion was made to secure the foremast by the assistance of our spars, and by noon she was in a condition to limp along with us, until they tried how much it would stand.

By Sunday, the 15th of November, we had only reached the northern end of the island of Balabac. On the 18th, we were off the Royal Captain Shoal; which by night is certainly most dangerous, particularly if a vessel should unfortunately find it to the S.W. with light winds. We tacked within one

cable's length of its S.W. extremity. It is not more than one mile in diameter.

On the 19th we made Bombay Shoal, passing within half a cable of its western extreme; no bottom with one hundred and fifty fathoms.

These patches are lagoon ledges, having about two or three feet of water over them, with deep blue water within. A few straggling coral blocks, not exceeding three feet in height, are here and there sprinkled over them.

Nothing particular occurred until the 27th, when we experienced fresh breezes, with very sharp gusts off the south end of Palawan, causing us to split several sails. The southern end of the island appeared either to form an archipelago, or to possess several very snug harbours. I am inclined to the latter opinion, as I did not observe corresponding openings on the northern sides of the headlands, and our in-shore reaches kept us close in with the land during the whole day.

On the 28th, we experienced a strong north-easter, which gradually veering to S.E., enabled us to round Goat Island, and shape our course for Manila. Both the Starling and Sulphur shaved the surf line of this island without obtaining soundings; therefore the dangers reported to lie to the northward of this island, are incorrectly stated.

At dawn the following morning, we had hoped to fetch into Manila, but baffling winds prevented us until the day following from entering the horns of

the bay. It was not until the morning of the 1st of December that we reached our anchorage off the town, in four and a half fathoms. The Starling had anchored the preceding evening.

We found here the Danaide French corvette, commanded by Captain Rosamel, (son of the minister,) and two English transports, having on board part of the troops from Chusan, sent here for the recovery of their health. They were under strict quarantine, and in consequence of the massacre of the English and foreign residents which took place in 1824, (supposed to originate in the introduction of cholera,) the authorities could not be persuaded to relax in their favour. Although, strictly, there was not the least chance of injurious result by permitting the officers to communicate with the shore for their general comfort, still the government was apprehensive that the native population and creoles would create some disturbance, or possibly insult the visitors.

After the visit of the captain of the port, whom I found to be a very gentlemanly prepossessing character, I accompanied him, together with Mr. Strachan and Lieut. Kellett, to pay my respects to the governor, who received us very kindly, and invited us to dinner on the day following. From thence we proceeded to the chief of the Hydrographic commission, and after entering into some conversation relative to their present operations in the survey of these islands, returned to Mr. Strachan's, the merchant who conducts the consular duties

here, and who at once made us at home, and installed us as part of his family during our stay.

In the evening we attended the ball, and were introduced to the beauties of Manila. The evening passed off agreeably. It is the custom amongst the merchants here to give a ball weekly, each in his turn, which renders the society very pleasant. The dinner hour is generally early; most people drive out after sunset, and visits are paid in the evening.

Manila is situated on the mouth of a river, which runs a considerable distance into the interior; its branches, particularly in the northern or mercantile town, forming a small archipelago. On the south side, which is a complete walled fortification, the governor, officials, and military reside. The Custom-house, merchant's houses, Chinese, &c., occupy the northern bank. The sides of the river are bounded by stone walls, which are carried out in the manner of canals, about six hundred yards to the seaward. On the northern extremity stands the light-house, and on its opposite a guard-house. At all times of tide the stream runs out, but the level is subject to tidal rise as far as the first bridge, at which point the stream is always fresh enough to fill water for shipping. Vessels of two hundred tons, or more, are brought into this canal. They have a dredging vessel worked by steam, which is kept pretty constantly employed. The Chinese carry on trade here to a considerable extent, but their abodes render the town very shabby in appearance; in fact, a sort of rag fair. The higher orders, how-

ever, reside in good houses, and their wares are only to be viewed within.

The party at the governor's passed off very agreeably. He was particularly civil. On my urging the necessity of deciding upon something relative to our pent-up soldiers in the transports, he immediately entered into a very full and satisfactory explanation of his reasons. At the same time, to show how very anxious he was to exert all the authority that he possessed, he directed a new board of health to proceed next morning, and allowed me to accompany them, and satisfy myself of their proceedings. Everything that could be done under their laws, was conceded. The officers who wished to land, were to undergo purification in a gun-boat for forty-eight hours, and might then remain on shore, but could not be permitted to pass to and fro; and in order to relieve them of any embarrassment, I placed myself in quarantine, after taking my final leave of the shore, by going on board to communicate the result of my negociations.

But disappointed men are rarely grateful for anything short of their desires. The indulgence and result of my exertions were hardly considered worth thanks, and I quitted them, sorry that I could do no better, but with the gratification of reflecting that the duty I had executed would be satisfactory to my commander-in-chief, to whom the governor begged me most expressly to say, that he would do all that his power permitted, but that he was controlled by the board of health.

Having taken my leave, and stepped the Starling's foremast, with orders to rejoin me with all despatch at Macao, I quitted Manila. I had heard that it was the intention of our commander-in-chief to commence hostilities on the 15th, therefore *hours* were of the greatest importance, and every exertion was used to beat up to Cape Bolinas, before stretching across the China Sea.

On the morning of the 13th, we passed within a mile of the southern edge of the Pratas reef, on which we noticed the wreck of a junk. The weather proved thick; and was attended with fresh breezes. We pushed on for Macao on the following morning (14th); but, by an error in the steerage, found we could not weather the northern Lemma, and therefore bore up, passing between them. About noon, we reached the south-west point of Lantao, and the breeze failing anchored off the rock on its western side.

It was my intention to proceed direct to Macao, but observing a pleasure-boat near us, we sent to inquire for news. The intelligence altered our plans. The admiral had resigned and gone home, and Commodore Sir J. Gordon Bremer was in command of the squadron, off Chuenpee; but the most interesting portion was, that no action had taken place. About sunset, the tide and breeze being favourable, we moved upwards, but were again compelled to anchor off Fansyack. After another tedious day, we sighted and anchored about two miles from the squadron, and that evening I paid my respects to the commodore.

CHAPTER V.

Naval force in the Canton river—The forts of Chuenpee and Tycocktow attacked—Destruction of the war-junks—Preparations for forcing the Bocca Tigris—A barber surgeon made prisoner—Turned to account—Operations suspended—The captured forts given up—Squadron descends the river—Take possession of Hong-kong—Hostilities resumed—Return to the Bocca Tigris—A battery constructed on South Wangtong—The forts of the Bocca Tigris cannonaded and stormed—Cruelties of the Sepoys—Ascend the river—Affair of the First Bar Fort—The Cambridge burnt—Unmask a battery—A man killed—Take possession of "Howqua's Folly"—Chinese charges for a gun—Operations in the river, and before Canton—Another truce and its remarkable terms—The Commodore goes to Calcutta.

CHAPTER V.

Neither letters nor orders awaited us; in fact, nothing was known about us; and (as some could not keep their own counsel) we were viewed as little better than interlopers. On this day they had expected hostilities. Had they taken place, we certainly should have been in sight, but there our part would have ended. We found, however, nothing at present in contemplation, and for some time we were kept on the tenter hooks of expecta tion. Our time was not, however, passed in idle ness, as we managed to carry on our immediate survey up to the battery ranges, and otherwise make ourselves acquainted with the ground. The Starling rejoined us on the 23rd December.

Various communications having passed between Her Majesty's Plenipotentiary and the Chinese authorities, decided operations were now in contemplation. Our force consisted of the undermentioned ships: Wellesley, 78, Captain Maitland, bearing the broad pendant of Commodore Sir J. G. Bremer;

Blenheim, 74, Sir H. Le Fleming Senhouse, K.C.H.; Melville, 74, Hon. R. S. Dundas; Calliope, Capt. Herbert; Samarang, 28, Capt. Scott; Druid, 44, Capt. Smith; Sulphur, Commander Belcher; Larne, 18, Commander Blake; Hyacinth, 18, Commander Warren; Modeste, 18, Commander Eyres: Columbine, 18, Commander Clarke; Starling, Lieut. H. Kellett. Steamers, Queen, Nemesis, Madagascar, and Enterprize.

Chuenpee, or Shakok, is supposed to be the outer defence to Canton river, but ships can easily pass it, and even through in the direction of Tycocktow (or Taikok) without much danger from shot from either battery. The first battery on the crest of Chuenpee, in the hands of practised gunners with good ordnance, would be a serious obstruction.

The island of Chuenpee is entirely composed of small hills, rising from a general level, which affords good valley passes for troops. By a reconnoissance, almost overlooking the enemy's works, it was evident that troops could advance, if covered by shipping on the west to create a diversion, and that the hill of Chuenpee once in our hands, the batteries beneath were untenable. The Chinese had thrown up a very perfect ditch, extending from the sea on the west, and completely surrounding their entrenched camp, and, moreover, had guns placed to command the several valley passes.

Tycocktow was an open-faced battery, which must inevitably fall under a direct attack from the shipping.

On the morning of the 7th of January the order of battle was issued. The western division, for the attack of Tycocktow, was placed under the command of Captain Scott of the Samarang, having under his orders the Druid, Modeste, and Columbine. The eastern division, under Captain Herbert, consisted of Calliope, Larne, Hyacinth; steamers, Queen and Nemesis, with boats of Sulphur, &c., Commander Belcher, who was ordered to place Queen and Nemesis to shell the enemy from the heights; and afterwards to attack the enemy's war junks. The troops and marines were to be landed, and advance by the valley, direct on the enemy's works; the brigade commanded by Major Pratt, 26th (Cameronians.)

This force consisted of a battalion of Royal Marines, under their gallant chief, Captain Ellis; a detachment of Royal Artillery, one twenty-four pounder howitzer, and two field-pieces, drawn by seamen, from Wellesley, Blenheim, and Melville; the whole commanded by Captain Knowles, Royal Artillery; detachments of 26th Cameronians; and 37th native infantry, under Major Pratt, amounting in all to about fourteen hundred men. The brigade, as before stated, under the command of Major Pratt.

The divisions landed about half-past eight. The Samarang led her division in gallant style, direct for the centre of the battery, anchoring within half a cable's length of the walls, followed by the Modeste, Druid, and Columbine; and quickly and gallantly was

their work achieved. Queen and Nemesis were duly placed, and dropped their shells prettily, the Queen firing the first shot, or "opening the ball," as Jack had it, when Calliope, Hyacinth, and Larne, anchored and opened on the Lower Chuenpee.

On observing the marines about to enter the upper battery, I transferred myself to Nemesis, and pushed on with our division of boats for the junks, giving Lower Chuenpee a dose of grape and canister, within pistol range. The Nemesis, drawing not more than five and a half or six feet, enabled us to get close up with the junks before opening fire, when several well-directed guns put them completely into confusion. The first rocket pitched into the magazine of the ship next the admiral, and she blew up in great style.

This settled the affair. The boats then moved on, and set fire to the junks in the lower part of the river. but in ascending the main branch, those retreating under canvass kept up a very spirited fire on the chasing boats, very gallantly kept in check by Lieut. Watson, of the Calliope. The increase of force soon decided their fate; two ran on shore, and the remainder made their escape.

The Nemesis having entered by the deep channel, came up in time to give the five retreating junks a dose, when the falling tide, and lateness of the hour, rendered it necessary to ensure her return. We first ran alongside the town, and selecting three of the most suspicious looking craft, they were towed down.

One proving to be merchant property, and her owners imploring her restitution in the most affecting manner, I released it; the other two were towed out, but one grounding outside, I left Kellett with the boats to destroy her; but as she was found to contain powder, this was not an easy task; she was therefore abandoned. Eleven war junks, including their admiral's vessel, were destroyed and burned.

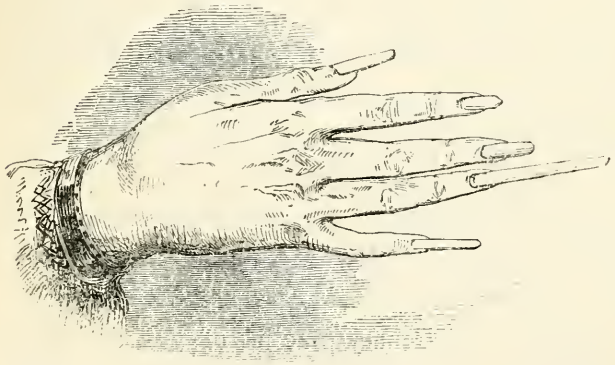
About five I rejoined the commodore, dined with him, and made arrangements for the work of the morrow; the squadron having already moved up in readiness to commence the attack on the Wangtong, Anunghoy, and other batteries.

Having waited on the commodore about daylight, (by desire,) it was arranged that having examined the line of danger, so as to admit of taking one of the line-of-battle-ships up the western channel to Wangtong, I was to place the Queen, Nemesis, and rocket-boats, flanking Anunghoy, and then pilot Wellesley to Wangtong.

In our affair of the junks, I had captured the admiral's flag, cap, *button*, &c., and he now had sent the comprador to implore that the latter might be returned to him. This having caused some sharp discussion, which interfered with, and, as I thought, delayed action, I instantly offered the button and cap, to put an end to the question; for which I was warmly thanked by Captain Elliott, as well as the commodore. I mention this circumstance, as the public prints have attributed this act of mine to Captain Elliot, instancing

it as a peculiar act of *kindness*. Indeed, I cannot, on mature reflection, at all reconcile to myself the justice of returning an enemy his sword or rank, when his desertion or abandonment of it have rendered him unworthy to wear it. However, as this button brought us nearer action by some minutes, perhaps hours, I was glad to pay the price.

Another still more unfortunate transaction marred



that day's operations. A Chinese barber-surgeon,* taken prisoner in Tycocktow, was allowed to go in with a chop,† intimating, "that if they wished their lives spared, or the action stayed, they had only to "Chin-chin," haul down their colours, or send out a white flag, and hostilities would cease;" meaning to intimate, that life would be spared by their pursuing such a line of conduct when they intended to submit.

* The woodcut of this hand of the barber-surgeon, was taken by making him place his hand on the paper, and tracing it out.

† Chop is a note or letter, and in this case, of truce.

This, however, was too great an oversight for a Chinese to let slip, and at the very critical moment when the Nemesis had opened a distant fire; and when a twenty-four pounder rocket had pitched into the fort from Blenheim's rocket-boat, the Queen also close in upon her station, about to enfilade, and in a few minutes more Blenheim's broadside to settle the question;—down dropped the Chinese banners, and out moved a Tankea boat, with an old man and woman *exhibiting* a letter. I was within shot of her in the Queen, about half way between her and the commodore, and perfectly aware of its meaning; but it appeared to the other officers of the squadron not a little strange that the flag of truce *answered this non-official demonstration from the old woman.* Up went the flag of truce, and action was annulled, before the *contents* of that paper *could* be known.

Under the customary practice of war, action had commenced, and we were certainly entitled to anchor, "muzzle to muzzle," when their colours were thus struck, and in that condition settle the terms of negociation; even if the act were not deemed a *virtual surrender.*

On the 13th of January, the Calliope, Sulphur, Modeste, Columbine, and Starling, (forming the light division,) anchored in line, off South Wangtong Island, preparatory to raising a howitzer battery on that island, and, supported by it, attacking the northern forts with the ships. On the 21st, these operations were suspended, by the pacific disposition

of the Chinese minister, Keshen; and the squadron were therefore directed to move back to Chuenpee.

Thus for a period ended this struggle; a messenger (formerly a disgraced comprador of the house of Dent and Co.) arrived to signify that he was prepared to treat. Keshen did not *personally* appear, but through this emissary sent his adhesion to the demands of Captain Elliot, as embodied in the treaty.

The only important point to which we became officially parties, was the cession of the island of Hongkong, situated off the peninsula of Cowloon, within the island of Lama, and on the northern side of entrance through the Lemma channel.

Captain Scott, of the Samarang, having been left behind to give up the demolished forts of Chuenpee and Tycocktow to the Chinese authorities, the squadron withdrew from the river, and moved down to the S.W. bay of Lantao; the commodore, shifting his broad pendant to the Calliope, moved on to Macao, accompanied by the Larne, Hyacinth, and Modeste.

The Columbine was despatched to Chusan, to recal the force stationed there, and further to direct its evacuation on the release of Captain Anstruther, Mrs. Noble, &c.

On the return of the commodore on the 24th, we were directed to proceed to Hongkong, and commence its survey. We landed on Monday, the 26th, at fifteen minutes past eight, and being the

bona fide first possessors, her Majesty's health was drank with three cheers on Possession Mount.

On the 26th, the squadron arrived; the marines were landed, the union hoisted on our post, and formal possession taken of the island, by Commodore Sir J. G. Bremer, accompanied by the other officers of the squadron, under a feu-de-joie from the marines, and a royal salute from the ships of war.

On the Cowloon Peninsula were situated two batteries, which might have commanded the anchorage, but which appeared at present to be but thinly manned; these received due notice to withdraw their men and guns, as part of the late treaty.

The French corvette Danaide having arrived at Macao, on a cruise of observation, and Captain Elliot having arranged to meet Keshen, and complete the negociations at the Second Bar, had invited Captain Rosamel to join the party at Chuenpee. The Hyacinth and Modeste, being off Lintin to maintain the blockade, refused to permit the Danaide to pass up: an official refusal was very politely requested, when it was arranged that the Hyacinth should remove to Chuenpee, where the blockade would be acknowledged. Both vessels having anchored there, Captain Elliot, with his party of the officers of the squadron, in the Nemesis, took Captain Rosamel on board, and moved on to the place of meeting. Keshen received them in state at the Second Bar, in tents, where they were

very handsomely entertained. A guard of marines, taken up by the steamers, was turned out, and Keshen, as well as the other mandarins, were particularly struck with their appearance and accoutrements. Various engines of war were exhibited, but from the nature and construction of those in use amongst their soldiers, I should imagine that they comprehended very little of their superiority.

Having completed the necessary data for the survey of Hong-kong, we quitted for Macao, intending to rate the chronometers, and complete a course of magnetic observations, preparatory to revisiting Manila, on our homeward route. The commodore had released me, in the full belief that the war in China was at an end.

On the 19th, the commodore being on a visit at Macao, I called to pay my respects, previous to taking leave, when I found that operations were to be renewed. I was, therefore, retaken under his orders, and directed to return forthwith to our late position off the Wangtong islands, and place myself under the orders of Captain Herbert. It appears that whilst the Nemesis was waiting for an answer to a despatch, one of her boats had been sounding, and the northern Wangtong battery thought fit to fire a shot at her. This was not the actual cause of this sudden movement. But the period having elapsed for the completion of the necessary documents of the treaty, and the intelligence from Canton clearly evincing hostile preparations, as well as the supercession of

Keshen by the exterminating Generals Yihshan Lungwan, and Yangfang, it became necessary to strike a sudden blow.

Having passed the light squadron during the night, and obtained some observations on Sampanchow, the Calliope, Samarang, Herald, and Alligator, passed up, and about four we rejoined them off Wangtong. A reconnoissance of the enemy's works was immediately made from the southern Wangtong, which they had neither fortified nor occupied; and preparations were accordingly made for constructing a howitzer battery on the saddle neck of that island.

As no immediate operations were to take place, the Sulphur and the Louisa tender moved down to Lintin Bar, to guide the ships of the line over the bar. Observing the Queen steamer coming up, I immediately put myself on board of her, and joined the commodore; leaving the Louisa at anchor on the tongue of Lintin spit, and one of our cutters on the opposite side, the Sulphur following us up. Just as we passed Sampanchow, we noticed the Nemesis coming out of Junk Creek, towing the boats of the light squadron, and displaying the Chinese banners captured at a stockade fort which Captain Herbert had destroyed. (Guns mounted and dismounted at this fort, about eighty.)

I accompanied Captain Herbert to visit it the day following, but a serious attack of fever left me little time for amusement. The thought of being left out of the approaching attack, did not tend to

relieve it; but a visit from the commodore and Captain Herbert the evening previous to the action, revived me considerably, and at four on the following morning the fever suddenly quitted me.

I immediately dressed myself, and walked the deck to gather strength, and about eight o'clock went to the Wellesley, when I contrived to scramble up the side and mount her quarter-deck. My orders were brief as usual—"Join Captain Herbert's division as before."

As the breeze was light, and scarcely gave steerage way, the squadron did not move as early as was expected. At daylight Captain Knowles, R.A., opened with his howitzers from South Wangtong, and kept the enemy pretty well amused throughout their lines. About nine o'clock I visited his battery, and took a fair view of the enemy's works, and as soon as the breeze freshened, repaired on board the Calliope. Passing close to the western battery, she was anchored within musket-shot, on its N.W. flank, opposing her broadside to the new works which had been thrown up on that face of the island. Samarang took up her station very prettily under her stern, and the cross fire of the two vessels was beautiful; it acted like masons chipping off the alternate angles of the nearest embrasure.

In a few minutes the enemy were flying; when, by Captain Herbert's direction, I passed to the commodore, and found Wellesley and Druid punishing the western heavy fort. Having communicated

"that there was no further opposition," I was ordered to see the troops landed immediately. It required but the sight of our despatch boat to set all the landing boats in motion, forcing my gig high and dry.

On landing, I immediately took possession of the pass above the western battery, and prevented any advance until a commanding officer was found to lead the troops; many of the landing boats' crews having quitted their boats, were sent back. I then directed Commander Fletcher to take the battery at the beach, and moved on with the troops.

Opposition there was none. The unfortunate Chinese literally crammed the trenches, begging for mercy. I wish I could add that it was granted. The Sepoys fired into them. Wishing to rescue some of them, I went into the trench and drew three out, motioning them to come amongst our troops, and they would be safe. Two were shot down whilst holding by my skirts; and one of my gig's crew, perceiving my danger, dragged me away, exclaiming, "They will shoot you next, sir." Thus much for employing troops who cannot understand English, and will only be commanded by their own officers!

Passing to the eastern battery, seconded by the first lieutenant of the Samarang, (now Commander Bowers,) we found not the slightest opposition. Indeed, it had been better if the troops had not advanced at all, for the hatred of the Bengal Vo-

lunteers towards the unfortunate wretches we found on their knees imploring for mercy, might have been averted, and our colours still unsullied. Over seamen I had control, and could make myself understood, but these Bengalese would not understand.

It is unnecessary to relate the numerous acts of ferocity and brutality that I witnessed. I saw one of them deliberately fire his musket at a magazine door, and mentioned it to an officer of the 26th; but it was of no avail; he was in the same predicament, and could only place a sentinel to prevent a repetition.

On my return, I met the Commodore and Captain Maitland. They were also busy in putting a stop to these irregularities. I do not believe, from the instant we landed, (and I was the first,) that one single individual was found in arms, and yet hundreds were killed.

Quitting Wangtong, I rejoined Captain Herbert, who, with Captain Elliot, moved into the Nemesis, and ran over to have a finger in the Anunghoy affair. But Sir Le F. Senhouse, in the Blenheim, and Captain Dundas of the Melville, had already done their work brilliantly. We saw Sir Le Fleming leading his men on to the second battery in good style. A shell was sent into the near corner, and it was then decided that it would not be fair to interfere with his laurels.

Before sunset the enemy were driven from every

post, even from their hill encampment; and the British were the only colours in sight. Captain Herbert having intimated his intention of moving on at dawn, I dropped Sulphur up to Tiger Island, leaving, en passant, a beacon on "the sixteen feet rock."

At half past six, A.M. Feb. 27th, we weighed, and led, followed by Calliope, Herald, Alligator, Modeste, Nemesis, and Madagascar steamers. The batteries on Tiger Island were deserted, and the guns withdrawn, probably for the new defences on Wangtong. At fifty minutes past ten we passed the second bar creek, and about a quarter past twelve, observed an extensive battery and encampment within the first bar. The channel was barred at the Chop House below Golgotha, by a floating bridge, and the Cambridge, now converted into a Chinese ship of war, moored above to cover it.

By signal, at half past one, we anchored off the first bar. I immediately joined Captains Herbert and Elliot in the Nemesis, and went in to reconnoitre. The Nemesis and Madagascar having anchored within, in an enfilading position, fired a few shots to try range. This was returned by the Celestials, and the question then became,—"can we retreat without their claiming a victory?" No one was bold enough to give his consent to such a proposition. It was, therefore, determined that our ships should come in. By the advantage of our boat signals the Sulphur was instantly underway to meet me; but

Attack on First Bar Battery, Canton River.

London Henry Colburn, Great Marlbro' St. 1843

I had promised Captain Herbert, the instant he approached, to join him. The Sulphur anchored ahead, in support of the steamers, and after watching the effect of a few of our *red-hot* shot, I joined Calliope, when she was placed within and ahead of the Sulphur, and after one broadside it was determined to storm. The other ships anchored in rotation.

In refutation of Commander Bingham's hearsay account, (p. 152 to 158,) it is merely necessary to refer to the public despatch on the capture of First Bar Fort, and it will then appear that the junior corvette did not lead into action, but that the facts are as above stated.

A hard embankment fortunately afforded us excellent footing, and the marines having been drawn up, and Captain Herbert joined the van, we entered without opposition on the S.W. angle of the battery, one party taking the eastern line, and the remainder the sea face. At some points the enemy behaved well; but as they could not stand an instant against disciplined men, a very few moments made the battery our own. The only living prisoners were two fine little horses, which were cast in the ditch, but helped out. One of the party mounted one of them, but was glad to be left behind, as, immediately on regaining the use of his limbs, he scampered off to the enemy.

The instant the battery was attacked, Lieut. Watson, first of Calliope, crossed their gig over the

floating bridge, and boarded the Celestial frigate, Cambridge. The crew had fled, and she was soon in flames. About dark, she blew up with a magnificent explosion. The solid wall or column of flame exceeded three hundred feet, and was capped by a mushroom head, of apparently fluid fire. In a few seconds not a vestige remained of this once British ship. This is the same Cambridge which was brought on speculation to China, by Mr. (now Sir C.) Douglas, was sold by him to an American, and immediately transferred, with her guns, &c., to the Chinese.

After spiking and disabling the guns in the fort, blowing up their magazines, and carrying off a stock of banners, we retired about seven. Thus in the short space of a few hours, all this very beautifully constructed, and (as far as silk banners and tents could make it so) beautifully decorated battery was utterly annihilated, and the valiant Celestials had fled no one could tell whither.

It has been the custom with all those with whom we have had thus to deal, to strip off every badge of military apparel the instant we come to close quarters; and I suspect that they conceive that having yielded *all*, their persons are free; at all events, they lose no opportunity to render that point secure, by their very rapid flight. By preconcerted arrangements with Captain Herbert, I am happy to say that no butchery was practised here.

In the morning I joined Captain Herbert, who, with Captain Elliot, and the captains of the squadron, proceeded in the Nemesis to examine the Salt Junk creek, and ascertain what depth we could carry up. After sighting "Howqua's Folly," and Napier Fort, where the river was observed to be staked, and junks sunk, we put her head downwards, to return to our ships. At this moment I noticed a suspicious smoke at the near angle of the trees, but as no report followed, I could not be certain that it was a battery.

On our return, our ships were passed through the raft at the First Bar, and anchored in Whampoa reach. On the following day it was determined that the Sulphur should move up the creek, and Captain Elliot having volunteered his assistance, we moved on without any accident, until we neared the suspected point, where I noticed the smoke yesterday. In my own mind, I was satisfied that we were to have amusement, and having with me a division of the Wellesley's boats, they were ordered "to close, load, and prepare for action." Our men were also at quarters, and red hot shot were in readiness for the bow guns.

We were not too soon. They instantly opened on us from a very well masked battery of thirty-five guns. The boats having been *warned*, required no further orders; and leaving Captain Elliot in charge, I jumped into my gig to recal them, (or "prevent their doing too much,") in compliance with Captain

Elliot's *wish*. They were, however, too quick for me. The enemy had fled, and our party (rather foolishly) had pursued them into the town, where they might have been cut off. In what direction to pursue them was a difficult problem; I therefore took means to secure their retreat, or aid them if requisite, and destroyed the guns and munitions of war. In this affair, we had the misfortune to lose one of the Wellesley's men, who was shot through the lungs whilst sounding. Having returned to the Sulphur, she was anchored in advance within two miles of Howqua's Folly, Napier's Fort being about one mile and a half beyond. The Herald, Alligator, and Modeste, entered the reach in the evening.

In commander Bingham's account, p. 159, he here makes not only a great mistake, but certainly appears to imply a want of discipline in Lieut. Symons.

The Sulphur *only*, and *not towed*, accompanied by the boats of the Wellesley, as I have before stated, performed this service. Lieut. Symons could not *order* when a superior was commanding.

"Howqua's Folly" is a quadrangular fort, constructed of granite, and mounting twenty-eight guns on its four faces. It was built at the cost of Howqua, the Hong merchant, either by a squeeze, or for some punishment. "Napier's Fort" is of similar construction, placed on the tongue of an island, commanding two passages, and intended to prevent

any more Napiers proceeding, *vi et armis*, to Canton. Drury's Folly is a lofty pagoda, but not in a conspicuous position, and is intended to point out the failings of the individual of that name.

On the 3rd of March the commodore joined us in the Madagascar, and having already examined the river, within musket shot of Howqua's Folly, I got permission to move the Sulphur, "but not to risk action for the present," a flag of truce having been sent by the American consul. On anchoring within grape range, but entirely protected by the bank, the enemy fired the gun nearest to us, and I suspect fled.

Major-General Sir Hugh Gough had arrived in the Cruizer, and taken command of the troops. I had now the pleasure of being introduced to him. As the Quangchowfoo, or mayor of Canton, was expected with a flag of truce, I was despatched to receive him, and conduct him to the Commodore. In my passage up the river, I took a glance at Howqua's Folly, but found it apparently deserted. The Sulphur was moved nearer to the battery, and hoisted the Commodore's pendant, and flag of truce. The Quangchowfoo passed without my noticing him, mistaking the boat which conveyed him for that of the American, who was in her.

As I considered Howqua's Folly virtually abandoned, I obtained the commodore's leave to take possession, and on reaching the gate, found some

people at the embrasures. As they did not attend to my gestures to open the gates, my boat's crew in a few seconds pitched me through the embrasure, when the Chinese vacated at double quick time by the opposite one. A shot soon opened the gates, the union was substituted for their hieroglyphics, and Lieut. Kellett, of the Starling, was left as acting governor. The gun which had been fired on my anchoring off the fort the first day, I found had burst, and driven its breech into the house behind it; probably committing more havoc amongst the garrison, than its shot would, had it fallen on board the Sulphur. On my return, I found the pendant of the commodore shifted to the Modeste, as they wished the Quangchowfoo to visit a vessel with a greater display of guns. (Vide Commander Bingham's account of this. p. 160.)

I was then despatched with a flag of truce to Napier's Fort, accompanied by Mr. Morrison, interpreter and secretary to the plenipotentiary. The flag of truce made use of on this occasion, was a large white silk flag, captured at First Bar Fort, and possibly recognised by some of the runaways here. After delivering the despatch, the mandarin in command agreed to give up the fort next day, if I would permit him "to make plenty of bobbery," "and not put that plum in the gun." I told him, as I should probably have the job, that I would not trouble him, provided he ran away in time."

These facts being communicated to the commodore, at eleven the next day, when the flag of truce came down, I was directed to take possession.

The enemy had commenced a very strong mud battery on the right bank, for thirty-eight guns; but I had been in its rear, and ascertained it to be harmless. On the left, in the opposite channel, a strong battery of forty guns covered Napier's Fort, and a wide and deep ditch at the floating bridge, flanked by a five-gun battery, prevented access by land. Of this latter we were not then aware. By boat signal, (all the captains being on board the Nemesis with the commodore,) the Sulphur was in motion before any of those anxious to lead could get to their ships, and was well supported by the Wellesley and Druid's boats, as well as her own. The ship was steered direct for the battery, the first lieutenant having orders to drop his anchor, so as to bring her stern to the raft, and port broadside to the gate within pistol shot; but not to fire without orders. We were in our boats, towed alongside.

Our respective terms of treaty were religiously observed. The enemy fired away all his rammers, &c., wide of us, and fled by one gate as I entered at the other. Two huge guns were pointed out of the archways of the gates; their calibre about twenty-four pounders, but much heavier than our ten-inch guns. These I had ordered to be embarked, but when they commenced drawing the charges, they found that each contained *seven shot and six cartridges,*

inserted alternately—I suppose cartridge first, but the contrary certainly would not surprise me. The whole charge, as their cartridges are not less than one foot in length, came pretty near the muzzle. The guns were too cumbrous to move during our limited stay.

A few minutes sufficed to make the fort British, and leading on the division for the centre of the bridge, a few strokes of a well-tempered axe, which is my constant companion, made a gap wide enough for ourselves, and ships if required, to pass.

The division intended to take the forty-gun battery were brought to a stand still by the ditch, but we pushed on and planted our colours. But what a mortification! not a gun or enemy remained; everything had been withdrawn during the night. A "flare up" we might easily have had, as the lines were plentifully strewed with powder.

The troops had been moved on, with their gallant General at their head, in order to take this battery in rear, as well as obtain the command of the main road to Canton; but he also had been impeded by the ditches and paddy fields, and returned as much disheartened as ourselves.

The Modeste and Starling had moved down on the 7th, to try another branch, called "the Macao Fort channel," and the Sulphur, without waiting longer, beat down, and reached the anchorage at Whampoa, seating herself on the mud about five o'clock, when I joined the General, Commodore Captain J. Elliot, and

Captain Herbert, on board the Calliope, at dinner. The Sulphur now proceeded up the Macao Fort reach, but unfortunately grounded, and returned. On the 13th she again moved up, but grounding again, was prevented having her shot at the battery before it was captured. I just reached in time, in my gig, to be launched over the rafts, and take possession of a very complete "*fast boat*," the crew of which ran her ashore and fled. Her commander was a mandarin with a white button, which latter I captured, together with sundry articles for the toilet, which prove that mandarin *dandies* exist. During the short interval of truce, we moved down to Sampanchow, to obtain rates for our chronometers, returning to Whampoa on the 11th.

As some pause took place before further operations, I busied myself with the examination of an unfrequented channel to the southward of Dane's and French Islands; indeed, one never attempted by ships on any previous occasion. Having ascertained that a corvette could be carried up to a position where the commerce of the enemy might be completely obstructed, I had permission to move the Hyacinth (18) thither.

On the 16th March, we started, and placed her in the southern end of the Fatee creek, and on the 17th at noon, returned to the Modeste, where I found Captain Herbert. The commodore was expected on the morrow.

The next grand attack was to be commenced on

the Crow's-nest Fort, where a floating bridge again obstructed the river. A five-gun battery above, flanked it, and two war junks were moored beyond. The enemy showed about twenty fast boats, pulling about fifty to sixty oars each, armed with one or two brass guns, and eight gingals, carrying four-ounce balls. My mind was fully bent on capturing these gentry. Through the Fatee creek I hoped to catch them in rear, whilst they were showing off before the shipping, (with a bridge between them.) The force to complete the service before mentioned, was the Modeste, Starling, Algerine, Hebe, Louisa, Nemesis and Madagascar steamers, and the boats of the squadron generally.

The Commodore, and Captain Elliot, accompanied by Captain Herbert and myself, proceeded in Nemesis to examine Fatee Creek from the position of the Hyacinth. It was found impossible to push the Hyacinth higher, nor was there room for the Nemesis. It was, therefore, decided that I should take the command of a division of boats through this creek. This division, consisting of the boats belonging to the Sulphur, Hyacinth, Calliope, Cruizer, and Pylades, and supported by my worthy friend Captain Warren, moved forwards about eleven.

Attaching our tow ropes to one of the large passage boats, we compelled her to tow us a considerable distance, so as to avoid being noticed by the Chinese. At the point where the creek turned off to Fatshan, there was scarcely room for our oars, and here a three-

gun battery had been prepared for its defence, but we found it deserted, and the guns withdrawn.

Having cast off from the junk, we had scarcely entered the narrow pass, when we descried a boat making off. It was fortunate for our party, as his range of sweeps required as much room as ours; and his advance cleared the way for us in full cry after him. How he contrived to pass, or whether the vessels, were thrust out purposely, I know not, but frequently we had not room for our oars; and for this reason he distanced on us.

At length the Broadway near the city opened, with Canton ahead. The action had commenced below, the vessels had passed the bridge, and the "fast boats" were flying in all directions. Warren and myself had entirely distanced our divisions; one huge fellow we chased for a long time within pistol shot, yet he gained on us, and we were reluctantly compelled to relinquish him, to make sure of the others, now well within our grasp.

The reports of the carronades of our boats soon told where they were, and having rejoined, the lighter boats were left in charge of the captured fast boats, and we then moved forward. The crowd of vessels falling constantly in our way, as well as myriads of sampans, &c., greatly obstructed our progress, and as we neared Canton, our vessels, *not aware of our manœuvre*, and mistaking us for the enemy, were dropping their shot freely amongst us.

As we sighted the Shameen Fort, it opened on

the steamers advancing. We were then completely under cover of the houses, and landed, expecting to drive them out by musketry; but found a deep and wide ditch between us, as well as a blank wall. The boats with guns were therefore brought up side by side to the piles in front, and five carronades, at thirty yards, played into their embrasures with grape, where they could not depress their guns. Joining Captain Warren in his gig, we landed, but before we could reach the gates, the enemy had fled. Having captured the fort, and the boats of the main division dropping in, I quitted, and joined the Nemesis, (leaving Captain Warren to move on to capture the Dutch Folly,) and was towed by her towards Rouge Fort, where having hauled down its colours, and left a party destroying the guns, I returned to the Nemesis, and was joined by Mr. Morrison, secretary to the Plenipotentiary. At the request of Captain Elliot, I landed, and re-hoisted the British colours on the factory. Whilst thus engaged, a party of soldiers rushed out of the Hoppo' office, and had nearly succeeded in cutting off part of my boats' crew. But, being reinforced by one of our divisions, we pursued them up Hog-lane, and drove them back with some loss.

On my return to the Nemesis, Captain Elliot requested me to take him to Howqua's house, or where his tea-boats are laden; and having seated himself in the bow of one of the vessels, despatched one of the compradors to say he wished to speak

with him. Howqua, however, would not come; he was probably too much frightened, and afraid of involving himself; but he sent down some tea,* which was rather acceptable. Captain Elliot then sent requesting him to tell the Quang-chow-foo "that he wished an interview the day following."

We then returned to the Madagascar steamer, where I found the Commodore. Some of the Chinese having fired on our boats, (from the Custom-house,) they were punished instanter by their carronades, sweeping the lanes, and the Madagascar also threw in several well-directed shells. Captain Warren and his division captured the Dutch Folly, as well as five of Lin's gun-boats, most grotesquely painted as dolphins, dragons, &c.

One of these having grounded, I was despatched to burn her, which having completed, I proceeded below Dutch Folly, where I found four fast boats, and a sand battery mounting five guns, very neatly masked with the mat bags; the guns truly *breeched* with matting. These were all destroyed. The arsenal, and ten new war junks, were left untouched. The fast boats taken by our division amounted in all to fourteen. Five junks with very valuable cargoes, estimated at two and a half millions, were not meddled with; and the force was employed, during the latter part of the day, in saving Howqua's tea stores from the flames, the war junks, which had been fired, having drifted on them.

* Bona fide in this case, a mixture of gunpowder, not Howqua's mixture.

October the 19th, the officers assembled in the factory. Howqua and Mowqua made their appearance, the former a very old infirm man, but I am sadly afraid they are both great rogues, and hostile to Great Britain. Shortly after, the Quang-chow-foo made his appearance, and was introduced in form, when we left him and the plenipotentiary to discuss matters.

It is rather a curious fact, that we should have replaced the British colours on the anniversary of their expulsion two years since.

Terms were arranged for re-opening the trade under a flag of truce! This was the amount of punishment awarded for their perfidy, and the expense incurred by her Majesty's government. *Truce* and *trade!* Why ask permission? The command of the tea, as well as the tea merchants, was in our hands; all the teas of Canton were virtually the property of the British crown, until awarded as prize-money, and therefore ought to have been sold by public auction. But it was a complete advantage obtained *against the British.* The increased price was placed on the tea, and river dues as well as other enormous absurdities were to be levied on our merchant ships riding under the guns, as well as the flag of truce at Whampoa.

By those only who *commanded the river* could those charges be levied. We were merely *to be permitted* to pay the tax levied on the Hong merchants to restore the fortifications, and afford fresh sinews for war, when it suited them to renew hostilities!

Some very warm discussions ensued amongst the British merchants at Macao, many of whom would most certainly have disdained countenancing such a very questionable mode of commercial dealing. But they were not solely British; there was no such feeling to deter foreigners from reaping a rich harvest, to the injury of the British; and the community did not, in fact, unanimously possess high feelings upon the question of "Tea or no tea." They were mostly the agents of English houses, and, as they said, could not allow their houses to suffer, to the manifest advantage of the foreigners.

Still, after all had been apparently settled, much distrust prevailed on both sides; and although the Chinese gradually began to return to their shops, and teas began to be shipped, still offensive edicts and chops (spurious as well as genuine) were daily appearing, troops arriving, and hostile intentions at no distant period very apparent. Forty-six boats full of troops (capable of holding one hundred and twenty each) passed the factory in one day. The long-expected successors to Keshen, the exterminating generals, Yihshan, Yang-fang, and Lung-wan, were said to have arrived, and their number stated to have increased to six. Still there was no meeting between *them and Captain Elliot.* Indeed, all the official duties appeared to be transacted by the celebrated go-between, the Quang-chow-foo (or chief magistrate of Canton); no meeting was *deigned* to our plenipotentiary.

As I foresaw further work preparing for us, I lost no time in making myself better acquainted with the river, and hoped to find the famed Fatshan as a second position for our next campaign. As it was necessary I should repair to Macao for a short time, I moved down to Whampoa, in order to ascertain from the commodore what his further intentions were respecting us, but I was not a little surprised to hear that I was too late; that he had quitted for Calcutta in one of the steamers, and that I must now look to Sir Le Fleming Senhouse for instructions.

On my arrival at Macao, I found the Blenheim there, and learned from Sir Fleming that it was expressly ordered that I should be detained. He directed me to retain the command at Macao, until my operations were concluded, and then to resume my examination of the river, as I might see fit.

Two officers of the Blenheim, Messrs. Toole and Bligh, were going off to the ship at night in a small cutter, when they were fallen on board of by pirates or fishermen, and were supposed to be murdered. It appears that they were in company with an Englishman who had charge of the cutter, and on the vessel falling foul of them, either to save themselves, or resent the affront, as they deemed it, they jumped into the Chinese vessel, which falling clear, made off. The body of one of them, Mr. Field, was afterwards picked up in Carlisle Bay, near the barrier, and bore marks of violence. Nothing had since been

heard of the others. It is suspected to have been the act of a notorious pirate belonging to Cum-sing-moon.

On the 26th, the Melville sailed for England, followed by the Samarang, on the 29th, and the Madagascar and Queen for Calcutta, on the 31st. From Sir Le Fleming Senhouse, I learned that the commodore hoped to resume the command about the first week in May, and that it was probable we should be required for active service (to proceed to Amoy) on the 10th of May, at which period he hoped I would rejoin him at Hong-kong. Accompanied by Sir Hugh Gough, he moved off in the Atalanta steamer, to arrange affairs at Canton, rejoining the Blenheim (which sailed next morning) at Hong-kong. The Jupiter sailed at the same time for Singapore and Trincomalee, for stores, troops, &c.

CHAPTER VI.

Examine the channels of the river—A fresh rupture—Treacherous edict—Many boats and junks destroyed—Reconnoitre for landing troops—Preparations for the advance on Canton—Storm the heights—Camp deserted—Casualties—Truce—Memorial—Chinese view of affairs—Memorial of Yishan to the Emperor—Reception of the terms of truce—Death of Major Beecher—Approach of the Chinese—The ransom paid—Premature death of Sir Le Fleming Senhouse—Commodore Sir J. Gordon Bremer returns—Typhoon—The Plenipotentiaries in the hands of the Chinese—Procure freedom by ransom.

CHAPTER VI.

On the 28th April we quitted Macao with the Starling in company, and moved up the river to the Wangtong Islands, the survey from that point upwards being entrusted to Lieutenant Kellett, of the Starling, until we should meet again. We moved up in the Sulphur to Macao Fort passage, when I proceeded by boat to call on Captain Herbert at Canton Factory, where our officers still maintained guard. Nevertheless, the river *extortions (dues* I can no longer call them) were duly paid to preserve peace.

I found every one extremely averse to my proceedings, and I fully believe that if I had not taken the precaution to obtain special permission upon *every tittle* of my intentions, from Captain Elliot, (through Sir Fleming, and officially forwarded to me for my guide,) I should have lost a golden harvest. To prevent discussion, I took short leave, commenced operations, and before sunset was out of sight in the other arm, leading to Fatee Creek.

By this course I became prepared for further

operations at Canton. A new scene was now opening to us, and we commenced exploring what was described as the main channel into the Broadway. This would have satisfied me as well, but I knew Fatshan was situated in that direction, and as the general report was, that their cannon foundry, gunpowder factory, as well as treasure, was at that city, it became important to know how far we could touch these most sensitive nerves by this route, rather than by destroying the idol, "the Golden Goose," (or in English *the tea trade.*)

During our examination of the Fatee Creek, (the channel through which our division pushed to Canton on the 18th,) we met numerous vessels moving off in great haste from Canton. At length a huge mandarin *ark* came suddenly upon us, escorted by five fast boats. The instant the man in command of the ark discovered he was amongst the Philistines, down flew his colours, and we had the satisfaction of seeing the Ko-tou performed in the most accomplished manner. I really pitied the poor fellow, and feared, if he beat his brains out on the deck, that they might demand me, as the not remote cause of his suicide. I perceived several very fair-skinned, fine-featured, and gentlemanly mandarins within the ark, and several very pretty and inquisitive females, with white chaplets (probably camellias) on their heads. In fact, it was a load of ladies. They were in all probability being removed on account of the extraordinary influx of soldiers. The mandarins did

not admire their curiosity, and pulled them away from the apertures. My friends in the fast boats passed quietly, when I bowed to one of the commanders, who civilly returned the salutation. We repassed them again in the Fatshan Channel, but they took one of the southern creeks, probably leading into the Broadway.

At the end of our second day's labour, our two advanced boats got sight of the city of Fatshan, estimated at two and a half miles distant, and subtending an angle of forty-six degrees. Unfortunately, this discovery was not made known until my return, which rendered further examination at that period impossible, the period for the completion of equally or more important portions of the river being now too short. The Sulphur therefore moved downwards on the 1st of May, and on the 6th reached Tiger Island.

Two extensive creeks, apparently communicating, behind the Anunghoy range, with Chuenpee, were now to be examined. On the 6th, we passed in behind Sawshee Hill, and returned by a creek about two miles below it. On the 7th, we passed into the Anunghoy Creek channel, communicating also with that of yesterday, and came out at Junk Creek, where the war junks were destroyed on the capture of Chuenpee.

By these examinations, we determined that a flotilla, drawing from ten to twelve feet water, could have proceeded to Canton by the back channels, entirely

avoiding the batteries of the Bocca Tigris, as well as that of Tiger Island.

Behind Anunghoy two very large towns are situated, and we were informed that they have, about three miles inland, a walled barrack, capable of accommodating six thousand men. It is a species of prison for pirates, and those under political surveillance. It is said that the garrison of the Bogue was sent there for punishment, as well as to prevent their communicating their *non-belligerent* principles to the valiant "rebel exterminators" about Canton.

On my former visit with one of the flags of truce, sent to Anunghoy Fort, I noticed many poor miserable creatures, who certainly were not fit to work the guns; and I was informed that they had impressed the *artisans of Canton* to complete their force.

Two of the officers landed near the town to erect marks, and although the crowd pressed about them, they were civilly treated. Rain and bad weather put an end to our operations. I therefore returned to the Sulphur, and moved on to Macao, to rate our chronometers, rejoining our senior officer at Hong-kong, on the night of the 10th.

Sir Le Fleming Senhouse was delighted at our success, little dreaming how soon the results of these labours would be practically tested, and how much to his gratification.

Preparations were immediately made to move on the 12th for Amoy and the north, the force to consist of H.M.S. Blenheim, Blonde, Sulphur, Hyacinth, Nim-

rod, Cruizer, Starling, Atalanta, and transports containing our active and worthy general and the troops. Everything went on swimmingly; we were anxious to throw off the ennui resulting from late inaction; but an ominous delay still hung over all. The merchants, who were well aware that hostilities must shortly be resumed at Canton, offered *bets* that Captain Elliot would not go to Amoy, and that the squadron would not quit Canton river.

On the 14th the bubble burst, and another turn was given to affairs: the Amoy expedition was adjourned, and orders issued to move again on Canton.

On the 18th the Sulphur moved up, and Sir Fleming having consented to place the Blenheim under my charge, I promised to put him, as well as the Blonde and transports, in safe berths in sight of Canton. It was therefore necessary to be in advance, and mark the dangers by Chinese boats, if they could be secured, otherwise the boats of the squadron would be brought in aid. The native pilots pursue this method, as the channel for heavy ships is rather serpentine.

Before advancing our force, it may be as well to state the grounds of the present quarrel. In the former armistice it was fully understood that any attempts to re-arm the captured forts would be considered as an infraction of the truce. It was clearly evident to every rational mind, that this had long been done, and moreover, that, in addition to the supplies of guns and troops in vast quantity, formidable

batteries were erecting at all points, *fire-rafts* were in preparation, and every act indicated immediate war. Even the Chinese themselves saw that it could no longer be concealed, and when they saw the foreign merchants withdrawing their property, fearful that they would escape their grasp, the following edict was pasted up on the factories, as well as copies furnished to the merchants.

"Yu, the acting prefect of Canton, issues this edict for public information, in order to calm the feeling of the merchants, and to tranquillize commercial business. It appears that the detachments of troops for Canton have all successively arrived; the laws for the army, however, are very strict, and without being commissioned, soldiers can never move about to create disturbance, Still it is feared that, as the military hosts are gathered in clouds, the merchants of all nations here engaged in commerce, hearing thereof, will tremble with alarm, not knowing where things will end. Some, frightened out of their wits, may abandon their goods and secretly go away; and others may not know whether to expect quiet or danger, while all cherish their fearful apprehensions. Those foreign merchants who are respectfully obedient, are viewed noways different from the children of the Celestial Dynasty; and the imperial commissioner, and general pacificator of the rebels, and the high ministers and joint commissioners, with their excellencies the governor and lieutenant-governor, managing all things with due

consideration, assuredly will not involve the good and the upright in trouble. These merchants, being respectfully obedient, ought to be protected from all injury, and the goods which they have brought with them ought also to be preserved in safety. It is, therefore, right to issue this edict for full information. And, accordingly, this is published for the assurance of the merchants of every country trading at Canton: to you who have always been respectfully obedient, and long enjoyed our commerce, the high officers of the celestial dynasty, in fulfilling the gracious pleasure of his imperial majesty towards foreigners, will give full protection to the utmost of their strength. Should native robbers and bandits come out to plunder or molest you, they shall be punished with increased severity; and any goods carried off shall be restored, so that the smallest loss shall not be sustained. And you, the said foreign merchants, ought also on your part to remain quiet in your lawful pursuits, continuing your trade as usual, without alarm or suspicion: but joining with the disturbed affairs will give occasion for subsequent repentance. A special edict."

Here was duplicity! Here stand forth the characters of the *high officers*, the élite of the honourable men of China, ministers and generals, fully bent on entrapping every foreigner on whom they could lay their hands. Captain Elliot forthwith issued the following circular:

"In the present situation of circumstances, her

Britannic Majesty's plenipotentiary feels it his duty to recommend that the British and other foreigners now remaining in the factories should retire from Canton before sunset.

(Signed) "C. Elliot, *H.B.M. Plenipotentiary.*
"*British Factory*, 21*st May*, 1841."

This was followed by fire-rafts, sent down on the Alligator off the remains of Howqua's fort; and, as customary, a general discharge of cannon, making much noise, but without injury, at least to the British. The Louisa tender and Aurora private schooner, anchored off the factories, escaped from guns as well as fire-rafts, by the exertions of the advanced squadron.

On the morning of the 22nd, a boat belonging to the Morrison, (American ship,) with four seamen, mate, and three passengers, quitted with "a chop," but were fired on, brought to, and carried into the city: all were wounded, and one was said to have been killed.

In the morning the Modeste, Pylades, and Algerine, accompanied by the Nemesis steamer, punished Shameen fort, after which the boats of the squadron, assisted by the Nemesis, moved up the creek towards Neishang, and committed sad havoc amongst their junks, which were evidently laden with guns for the new fortifications, some weighing four or five tons. Thirty-nine junks, smacks, and fire-boats were burnt.

The Chinese then attacked the factories, particu-

larly those on the British side of Hog Lane, making a perfect wreck of the beautiful pier-glasses, chapel, &c.

On the 20th, the Blenheim reached Tiger Island. On the following morning she moved to the second bar, and anchored; when, having placed the boats of the Sulphur, Blenheim, and Starling, in their positions, she weighed, and I took her in tow with the Atalanta steamer. The day was beautiful, and everything favoured us. Passing the first bar by the New or "Victoria Channel," I placed the Blenheim in a free swinging berth, five miles above the first bar, in sight of the advanced squadron and the city of Canton, and nine miles direct from the factory. I could have carried her three miles higher, where several of the deep transports were afterwards placed; but although a safe berth could have been found, it was important to carry the transports there, and therefore not risk, on a falling tide, choking the channel, should she touch. I then brought up the Blonde, and afterwards the heavy transports, including the Marion, with Sir Hugh Gough, and Head-Quarters.

The remainder were left to the guidance of the officers of the Sulphur, and Mr. Brown, master of the Calliope. This part of my duty being completed, and some doubts arising relative to the actual points of *terra firma* on which the land force could act against Canton, I immediately requested "to be allowed to put the matter beyond doubt by a decided reconnoissance."

This being acceded to, and the Sulphur having already moved up to the squadron off Canton, orders were issued for each of the advanced squadron to furnish an armed boat, which, with the launch of the Druid, under the command of my staunch supporter, Lieutenant Goldsmith, (first of that ship,) and the boat force of the Sulphur and Starling, advanced on this duty about nine A. M., the morning following.

As my attention would in all probability be entirely bent on the reconnoissance, and I might even be detached for a time, the whole division was placed under the command of Lieutenant Goldsmith, acting under me. The first part of my instructions directed me to collect sufficient tea-boats, or other large boats, for the conveyance of two thousand men, should I fall in with them. I therefore pulled up close on the Fatee side, and turned ten, capable of holding one hundred and twenty each, into the stream, calculating that with the ebb-tide they would soon drop down on our squadron; a cutter, one of our division, was also detached to watch them, and returned as we reached the creek, where the Nemesis and boats had yesterday had their amusement. The junks were still smoking, and amidships in each we noticed at low water the huge guns intended for the use of the exterminating army. We little dreamed of anything remaining for us to do, although I had my suspicions.

On reaching Neishang, where the Nemesis terminated her work yesterday, we noticed two flotillas of

fast boats, brave as usual; their numbers probably, together, about forty. As I had begun to learn that these gentry would give us a heavy tug at chasing, I determined to use stratagem. Just opposite to Neishang the stream forks; one branch to the left, leading towards the west, and probably rejoining the main stream; the other to Tsingpoo. As I noticed the flood setting on the angle, I knew that if I could get one division within the influence of the Tsingpoo stream, I could secure their capture by cutting direct for the angle. One division most assuredly kept command of that to the westward, in order to *ensure escape.*

Our boats having come up and formed at the last burned junk at Neishang, the enemy, mistaking the reservation of our fire, assumed a more hostile attitude, and passed the rubicon. Our fire opened, and faster than my pen could state the facts, we found ourselves in possession of fifteen fast boats, five war junks, and several row boats, carrying from four to six gingals each, and amounting in all to twenty-eight vessels. One of the largest fast boats, rowing sixty oars and armed with two brass six-pounders in the bow, and eight gingals, was preserved as a trophy; the remainder were burnt.

Moving on, we landed at the temple of Tsingpoo, where a sand battery of five guns had been erected. The guns were thrown into the sea, and the battery reduced to a level.

As my war operations had now ceased, I turned the

command over to Lieutenant Goldsmith, directing him to see the vessels completely destroyed. The enemy, who had retreated to the brow of the range which overlooked the river by eighty feet, annoyed us occasionally from their gingals, but were repaid with interest by grape from the boat's carronades.

As nothing could be seen from the river, and without a distinct attack on the heights by our whole force we could not effect our object of reconnoitre, I determined on trying, in the first instance, how far I could effect my object from the masthead of a junk. One particularly adapted to this service lay immediately in front of where I suspected the enemy to be encamped in force. Accordingly I went on board her, and luckily finding her geer rove was hoisted to her masthead, (above one hundred feet,) sextant in hand, and to my delight, obtained a complete view of the whole country between the temple and the batteries on the heights. As I suspected, the enemy were encamped just within the verge of the hill. I have not the slightest doubt but they would have fled on our rising the hill.

It had quite escaped my recollection that I had ordered all the junks to be burned; my attention was deeply engaged elsewhere, and on my descent, I found a fierce fire raging beneath me. After adding fuel to help it, I quitted, but had not moved more than one hundred yards, when she blew up

with a grand explosion, and sunk but remained with her masts standing, thus effectually securing this position. Off and alongside the temple, I found four and a half fathoms at low water, and by our survey downwards, became fully satisfied that the Sulphur could, with care, be brought to support the troops, and serve as a rendezvous.

Our operations in this neighbourhood being complete, we moved out, taking with us, in addition to our fast boats, a state mandarin (house) boat, which served me well as a cabin for the next twenty-four hours. Crossing over to the creek above Fatee, we extracted three fine boats from thence, one a salt vessel, capable of holding a whole regiment; it was immediately named "Noah's Ark" by the sailors.

These were towed down. Captain Barlow of the Nimrod had also secured several others by the division under his command, all of which were sent down to the Blenheim that evening.

Aware of the anxiety of Sir Fleming to know the result of my mission, I moved on immediately, and reached the Blenheim at half past eleven that night. Sir Fleming was reported to be in bed, but was sitting in his easy chair, and when I entered, he observed, "Well, Captain Belcher, I thought I was right in sitting up for you."

The report delighted him beyond measure, and his anxiety to communicate it to the General outstepped the fear of disturbing his slumbers. A

boat was immediately despatched. A bed had been prepared for me in the cabin of the Blenheim, but I preferred returning to a nap on board my mandarin boat.

At dawn I rejoined Sir Fleming, and volunteered my services to number and distribute the troops to the boats, and as it was the anniversary of her Majesty's birth, we hoped to commence action that day. I was immediately despatched to the General, who ordered Major Beecher, the Quarter-master General, to accompany me forthwith. This service being complete before ten o'clock, and expecting the steamers to be shortly at my heels, towing the troops, I took my leave with *carte blanche* from Sir Fleming "to place the Sulphur where I wished." The corvette squadron off Canton would otherwise have been under my command, but Sir Fleming having determined to accompany the general, and placing me on his staff, I preferred the more active appointment. My good friend Captain Warren, of the Hyacinth, therefore became senior officer off Canton.

On reaching the Sulphur, I found the ships dressed with ensigns at the mastheads, which was shortly followed by the rolling roar of a royal salute in honour of her Majesty's birth-day. But few minutes were lost there. Ordering the Sulphur to weigh, I visited Captain Warren, gave him the orders from Sir Le Fleming Senhouse to be prepared to take up their positions at two, and moving

thence to our Plenipotentiary on board the Louisa cutter, informed him of my intentions, &c. The civil community deemed me mad; several had *seen* the river *dry across*, and I was set down as "cracked," at least.

The Sulphur, under all canvass, with her ensigns still displayed, soon picked me up, and to the confusion of the overwise, soon disappeared amongst the trees. She touched, but soon moved on, and at four P. M. was safely anchored alongside the temple of Tsingpoo.

Parties were immediately employed to clear the temples for the accommodation of the troops. A fine fat buck, found within the walls of the temple gardens, was sentenced to death by drum-head court-martial, and turned over to the cook, as groundwork for a hot supper.

I then proceeded to the heights with a party of seamen, and found the enemy had decamped, and that nothing to oppose us was near. Look-out men were then stationed at the mastheads, and preparations were made to receive the general and our naval commander-in-chief, who were observed approaching in the Nemesis, with troop-boats in tow.

About sunset, the troops commenced disembarking from the junks or tea-boats, in order to relieve the pressure. The General, Sir Le Fleming Senhouse, and the staff, supported by a strong party, advanced to the position lately occupied by the enemy's encampment. It was too late to see anything, yet

at the same time it was necessary to have command of the heights, in case of any extraordinary exhibitions of valour during the night.

During the time we remained there, the Chinese set up a few yells, and burnt a species of Roman candle, the balls of which served to show us in position. I suspect them to be part of the stores of the fast boats; if so, they are constructed of bamboos of two inches internal bore, and intended to point at those attempting to board; probably expecting that a fire ball in the face might damp their ardour.

In the midst of this, our attention was arrested by sounds which we mistook for the cries of a Chinaman under punishment, or in distress certainly; but they passed unnoticed, and utter darkness prevented our seeing many yards around us. On the morning following, it proved to have been the cries of one of the camp followers, who had gone to a pond for water, and having been caught by the Chinese, was then undergoing decapitation.

The fireworks having ceased, and quietness prevailing, an additional force arrived, and the General having given his orders for the night, we retired to the Sulphur, where, having done justice to the mandarin venison, the chiefs retired for the night. An alarm was sounded about midnight, and in a few seconds we were on shore. The exact cause was never ascertained, but I believe that it arose from a pig having made a desperate sally upon the "piled

arms," and thus created great confusion. Had they seen his *tail*, they might easily have determined that he was not a Chinaman. Indeed, they take very great precaution not to permit such a handle to be dangling " on service."

Sir Le Fleming Senhouse having joined the staff, the command of the marine battalion was given to Captain Bourchier, of H.M.S. Blonde, having under him Captain Maitland, (Wellesley,) Captain Barlow, (Nimrod,) with their lieutenants of divisions.

Having made a hearty venison breakfast at the expense of the god of physic, (the lord of the manor of Tsingpoo temple,) and the remainder of the force having disembarked, we met the general at our last night's position, and before eight we were on the advance. Only a few straggling parties of the enemy were noticed, and these in great disorder, and probably not belonging to their regular army.

They occasionally exhibited in pantomimic gesture the bravest of the brave, and intended us to believe they were anxious for closer acquaintance.

The first brigade was formed of the 49th and 37th regiments, with a detachment of Bengal volunteers; the second of the royal and Madras artillery, sappers and miners. The corps of seamen formed the third brigade in the right column. The ordnance was intended to consist of four twelve-pounder howitzers; four nine-pounder field-guns; four five-and-a-half-inch mortars; fifty-two thirty-two-pounder-rockets, and two light six-pounders.

The left column consisted of the 18th royal Irish, 26th Cameronians, a detachment of Madras artillery engineers and sappers, with a six-pounder, and a five-and-a-half-inch mortar. The royal artillery had also their rocket-frames with nine-pounder rockets, as well as a few musket rockets.

Our progress was not rapid, as the lines of road had to be examined before adopted, and guns were but slowly advanced. About nine o'clock, we had advanced to the first joss-house within reach of what were afterwards termed the seamen's batteries, Kung-kik-tai, or "fortress of extreme protection," and here the rockets were in excellent distance. The enemy threw the shot over our heads without injury to our party, and their grape-shot constantly dropped amongst us, but without damage, being merely spent balls.

I found I had by some means distanced the General and Sir Le Fleming, and a message from the General to the artillery, to direct the guns on a battery to the left, was the first intimation that he had taken a different route. We had no guns, but about this moment Lieut. Wood, of the Sulphur, reported to me that he had, by the exertions of a detachment of the Sulphur's crew, brought up one of the twelve-pounder howitzers and the nine-pounder field-piece was following. This gun was immediately turned over to Captain Anstruther, of the Madras artillery, who in a few minutes did good

service, clearing the battery above us, as well as completely fulfilling the General's intentions.

About this moment, I observed the General, with the 18th and 49th under Colonel Morris, ascending the hills in front. Thinking that the enemy would, in all probability, retreat down the gorge, I determined to make my advance to rejoin by that route, and was moving forward, when Captain Elliot requested convoy, which was of course granted. We very soon found that we had not selected the best road for the safety of the plenipotentiary, and under a general salute of every species of arms from the whole face of Canton walls, we reached our friends at the Hill Fort, Pou-kik-tai, or "Extreme Security," without accident.

This work, a large square stone battery, having embrasures on each side, and an interior turret mounting nine guns, had always been one of my principal objects in the survey of the river, and therefore became doubly interesting. It is situated on a very steep mound, overlooking the walls of Canton, and within accurate musket shot, the space between, forming a very deep natural ravine or ditch. It is also within musket shot of the "Five-story Pagoda."

As the enemy continued to annoy us much from a three-gun battery immediately in front, I commenced upon them with two of their own six-pounder guns, from the turret, and found them carry pretty truly with *half charge* of their own cartridges,—which

are each about eighteen inches in length! But as the balls from the gingals flew very thick, and Sir Le Fleming thought that our men ought scarcely to be risked for the damage that might be done to one or two Chinese, the fire was discontinued.

A small cohorn, under the direction of a young officer of the Madras artillery, (just arrived in time to share in the affair,) proved very effective; his first debut *on service* was to throw several shells very beautifully; the third blew up a large magazine, in rear of our friend the three-gun battery, and for a time reduced the annoyance from that quarter; but during the night they rested not.

At the same instant that the troops stormed their forts, the blue-jacket division, under their worthy leader Captain Bourchier, gallantly carried the two batteries assigned to them, (Fortresses of Perpetual Bliss, and Everlasting Security.) But they were less fortunate in quarters, as being nearer the lines, and quite unprotected, the enemy kept up a well-directed fire upon one spot, of which they doubtless previously knew the range. The six-pounder, under the command of the Hon. Lieutenant Spenser, R. A., was sent to their assistance, and they managed to repay their civilities; not, however, before Lieutenant Fox and Mr. Kendal, mate, both of H. M. S. Nimrod, had each lost a leg, and several seamen were severely wounded. The former expired shortly after the operation of amputation above the wound.

Hardly had the troops regained their wind,

(dreaming little of further operations,) when the reserve was directed to attack the entrenched camp outside of the N. E. gate. As this position was out of range from our battery, and the advance exposed to the whole of that line of city wall, it was at once perceived that this was to be a lesson to the Celestials how little we cared for them in the field.*

The enemy had taken up numerous scattered positions, with gingals placed in the paddy fields, from which they could, almost unseen, or, as bad, unnoticed, being in pairs only, completely gall the advancing party. Those in the camp were waving their banners, and inviting their opponents to advance, with every imaginable gesticulation. At double quick time, forward dashed our friends the Royal Irish, and in a few moments the theatricals were ended. "Sauve qui peut!" I suppose to have been the order of the Chinese general, and most obedient they proved. I do not believe an opponent was found after the troops entered the encampment.

It was beautifully done, and beautifully followed up; no confusion — no helter-skelter plundering, which we had before been disgusted with; but the troops were formed coolly in their new barrack-yard *pro tem.*, and parties were employed to execute the duty of destruction. The customary trophies of course were not left behind, and shortly, in the same

* It was generally remarked by the Chinese, that if they once got us on *terra firma*, the chances of war would be reversed.

military style, they quitted the demolished camp on their return. All this we witnessed and enjoyed from head-quarters.

On this duty, four officers and several men were severely wounded. Colonel Morris, of the 49th, commanded this service, and brought away the general's horse, most magnificently caparisoned. Why did not the general fly on his back? Probably they make a point of leaving enough behind to rescue their carcasses.

The enemy continued to worry us by their firing during the whole night, but without damage to any person; but suddenly in the morning their fire slackened, and at daylight had entirely ceased. The first despatch from "*the Blues*" acquainted us with the death of Lieutenant Fox, who did not rally after amputation.

At the time these operations were going on, an attack was made by a party at the beach, but was repulsed by the seamen under the command of Mr. Goss, acting master of the Sulphur, assisted by detachments of marines, and troops.

I suspect the Chinese paid dearly for this freak. As this disposition rendered the village behind the temple too dangerous a redoubt in our rear, it was directed to be destroyed.

On the morning of the 26th, it was eagerly expected that we should escalade the walls of Canton; but as it was deemed important to bring up further supplies of rockets and carcasses, as well as ammuni-

tion, a party was despatched for this purpose to the Blenheim. Had it been possible to foresee events, doubtless the British colours would have been flying on the walls at dawn.

In the afternoon a flag of truce was displayed on the city walls, when I was deputed to accompany Brigadier-General Burrell, with Mr. Thom, interpreter, to ascertain the cause, and their object; at the same time to acquaint them "that no interview would be granted but to their commander-in-chief, and then outside the city walls, and further, that no terms but those of submission would be listened to." Time was afforded them until half-past three, at which period hostilities would be resumed. At the expiration of that period no one came; and at a later period we would not listen to them.

Early on the morning of the 27th, the flag was again displayed, as well as another of larger dimensions. I was again sent up to the wall, with Captain Gough, the General's aide-de-camp; there was much repetition of yesterday's work, and nothing done. Towards sunset a letter was presented, but as they offered it *for* Captain Elliot, and he was on the sea side of Canton, they were desired to take it to the ships of war.

During the morning, the General and Sir Le Fleming Senhouse held a parley, under the city wall, with a red-buttoned and peacock-feathered mandarin, (who stated himself to be the General,) but without effect, although many compliments were exchanged. It

will be seen by the following memorial to what purpose this was converted.

Memorial from Yishan and his colleagues to the emperor, concerning the capture of the forts and height above Canton.

"This day, the 14th day of the fourth moon, (3rd June, 1841,) we, the great rebel-quelling General Yishan, and the Lieutenant-Generals Lungwan and Yangfang, respectfully take all the facts relating to the English foreigners making an attack on the provincial city with their ships, and that we exerted ourselves to the utmost, leading on our soldiers to defend the same, which happily has escaped without much damage: and after considering the whole state of affairs, how that we have adopted certain temporary measures, suited to the exigencies of the case and having for their object, our being able in future to maintain the place: all these facts we now respectfully embody in the present memorial, looking upwards, and hoping that it will obtain a sacred glance. Your slaves already, on the sixth day of the present moon, (28th May, 1841,) took all the details of what had occurred up to that date, and duly forwarded them as recorded.

"The city of Canton stands at the foot of a hill called Kwangin Shan, while its front extends to the banks of the great river. To the north-west is the department of Shaonking-foo, and to the north are the les-

ser districts of Nanheung Chori, Leënchow, &c., &c., all of whose merchants and travellers come to the provincial city by several branches of the river, which passes by Fatee, and afterward mingle their waters with the great ocean.

"From the time that the foreign ships forced their way into the provincial river, they stationed a great many vessels, (at the most important points,) and thus grasped the very throat and windpipe of our communication. The eastern branch by Leëtein, (neighbourhood of Howqua's Folly,) and the western branch by Taou Hwang Kaou, (Macao passage,) both communicate with Whampoa, and thence to Bocca Tigris: there are many arms of the sea flowing in different directions: the creeks, inlets, and outlets, most multifarious; during the floods, the whole country is under water, and there is no important pass where a garrison might be placed for defence. Moreover, the fields are cramped and narrow; it is not easy to find a place to pitch a camp; the hills on the north command the city, so that one may look down and see everything going on within; and the foreigners were constantly in the habit of prying and spying; *forsooth it was no easy matter to prevent them.*

"Having previously prepared our means of attack by fire at Neishing, fifteen leagues from the city, in which we used rafts of wood floated down from Kwangse, and quantities of paddystraw brought from Kinshan, and other places in the lesser districts of Sanshway, we

despatched several special messengers, in order to have them bound and properly placed, (to drift on the foreign ships.) But these said foreigners, having found out, for the second time, that our fire-rafts were about ready, drew the sword, and commenced the war from the first of the moon. The rebels sent their ships' boats* secretly to sound and get information, but they were beaten back by the officers and soldiers of the garrison, who opened upon them a fire of great guns and matchlocks. So it was until the fifth day, (Tuesday, 25th May,) when thirty-eight sail of foreign ships rushed up in a body and attacked the city; and at the same time, (another body of the rebels) proceeded in steamboats to Neishing, and opened their fire upon it. A number of native traitors, dressed like sailors, in the confusion, got into our ships, which were filled with paddy straw, and set fire to them right and left, and burned the greater part of the fuel in the rear of our troops. These native traitors then swam on shore, and proceeded by land to our rear, and thus Neishing, being simultaneously attacked on three points, could hold out no longer.

"At this time, the river being blocked up (by the enemy), there were no means of forwarding any communication; those who hurried onwards to work the guns had no way of getting there, and those who had previously gone to hasten the arrival (of other guns), had no way of getting them transported to the city.

* Were these the Sulphur's boats?

"As regards stores for the soldiers, though we had abundance of corn heaped up in our granaries, which we could have ground at any time, yet the food and rice of the common people is all brought from the country round about: thus, in making a stout defence of the city, the merchant could never dispose of his wares; and what would be worse, the people could not without difficulty procure their daily food. Add to this, that the roar of the cannon was unceasing, the people of the new city, (south side,) one following the example of the other, all moved into the old city, (north side,) and there they had a struggle. Such a state of things could not last long before the supply would become exhausted, and then the anger of the multitude would be quite irrepressible! We humbly think that the important post of the provincial city concerns the whole province; should it be lost by any remissness, then the thieves and vagabonds of every district would avail themselves of the opportunity, and rise in swarms like so many wasps! Moreover, an organized army (though disbanded) may be reassembled; in marching troops through the country, numerous opportunities present themselves for selecting important passes, and engaging the enemy at advantage: but there is no principle by which we may abandon the provincial city to its fate; if the city hold out, or if it be lost, and for us to perish along with it, does not appear to be the plan best suited to the welfare of the country! We your slaves have again reflected on all the circum-

stances of the case, and are compelled to confess that we found ourselves at our wit's end.

"Having previously examined the site of the city, and found that the forts on the north were small and cramped in their construction, and could not contain many soldiers, we could only select our best troops, and station them on the northern quarter, placing some guns there, that they might make a stout defence. Thus they waited until the foreigners, having landed from their ships at Neishing, were pushing straight forward to the north side of the city, when our men opened a thundering fire, and killed more than ten of the foreign rebels, and upwards of a hundred of the native traitors. The said foreigners upon this retired to the heights above the town, and the forts remained in their possession; it being now dark, we drew off our troops within the city. Thus matters went on till the seventh day of the moon (Thursday, 27th May,) when the whole of the inhabitants of the city came rushing in crowds, and presented petitions, begging and praying that we would take measures to save their lives, and at the same time the soldiers on duty at the embrasures reported that they had seen the foreigners beckoning with their hands towards the city, as if they had something to communicate.* We thereupon immediately ordered

* All this is founded on the *notice* taken of the flag of truce, and proves the wiliness of these people. Formerly the flag was fired on; yet now they have ascertained its power to suspend

the brigadier Heung Say-shing, to mount the city wall, and look. He saw several 'barbarian eyes,'* pointing to heaven and earth, but could not make out what they said. He forthwith called a linguist, to inquire what they wanted, when it appears they said that they begged the great general to come out, as they had some hardships to complain of to him; upon this, the commanding officer, (or tsang-ping,) Twan Yangfuh, said to them in an angry tone, 'How can the great general of the celestial dynasty come out to see such as you? He has come here by command of the great emperor, and he knows nothing more about you than to fight with you!' Upon this the said barbarians took off their hats and made a bow; then they sent away the people who were about them, and casting their weapons on the ground, performed an obeisance towards the city wall. Twan Yangfuh,—having previously got permission from us your slaves to do so,—then asked them what grievances they had to complain of, which caused them to resist the forces of the central land, and conduct themselves so madly and rebelliously on many occasions. They, in course, replied that they,

operations until it suits their purpose to renew hostilities; and they do not admit in any shape in their memorial that it was displayed on either side. The taking off the hat, which the general did in courtesy, as a salutation, when he was apprized that Yang was the person speaking from the walls, has been prettily twisted.

* High characters.

the English, could not carry on their trade, that their goods were not being consumed, that their capital was wasting away, and that their debts were not being repaid them: and that as both parties were firing off their great guns on the side of the new city, they had no means of making a communication there, and therefore they had come to this side, to beg the chief general that he would implore the great emperor in their behalf, that he would have mercy upon them, and cause their debts to be repaid them, and graciously permit them to carry on their commerce, when they would immediately withdraw their ships from the Bocca Tigris, and deliver up all the forts they had taken, and never dare again to raise any disturbance, and other words to that effect. And at the same time all the Hong merchants handed in a petition, stating that 'the whole body of the foreign merchants had authorized them to say for them, that they wanted to carry on trade as before,'* and to have the debts cleared off which have been owing to them for many years, when they would immediately take all their ships of war, and withdraw them beyond the Bocca Tigris,' &c. Your slaves, having taken an enlarged view of the question, and duly weighed and deliberated thereon, came to the conclusion that the defences of the Bocca Tigris being already lost, those within, and those without had alike no place of strength to depend upon, and it would be better to grant their

* The old story against Captain Elliot.

terms, and thus save the city from its perilous situation, and reanimate the drooping spirit of its inhabitants, rather than continue a struggle which was jeopardizing the many millions of lives of the whole province, and which might not have a successful result after all. On summing up the pecuniary resources of the single province of Canton, we find that its custom-house duties and land-taxes do not yield less than three millions of taels annually; and if we could only get these foreign claims cleared off, in the course of a few years the province would recover itself; whereas, if we sit idly waiting for a long time, perhaps some unlooked for calamity may overtake us, when not only will it be impossible for the province to recover itself, but it will be involved in vast expense, thrown into utter confusion, and the common people of the land, who are the very essence of the land itself, should they meet the poisonous influence (of a foreign war), the consequences might be very grave indeed. Therefore, it was that after maturely deliberating together, we despatched the Quang-chow-foo, Ya Paoushun to do the best he could, and, in accordance with the request of the merchants, to grant for the time being the favour of carrying on commercial relations to all countries on the same footing; thus viewing the recovery of the people from their state of destitution as the object of primary importance.

"Commerce is to these said foreigners the very artery of life. Let us wait quietly till the foreign

ships of war have retired, and the native traitors are dispersed, when, beginning with the river in front of the city, and continuing the work down to the Bocca Tigris itself, at every important pass we shall block up the course of the river with piles of stones, and there erect forts and place guns: and thus, having secured the door of entrance, we shall have ample means to oppose their progress, and maintain our defences. And finally, having thus our gripe on their thrapple, should they ever dare again to give rein to their outrageous conduct, we can in a moment stop their commerce: this, then, is a mode of governing them which is always in our hands. These facts relating to the late attack on this city, and the temporary expedient which we have adopted in the exigencies of the case, we now respectfully unite with the other memorials which we have sent up successively, and humbly hope that a holy glance may be cast upon them, and the sacred will in course manifested."

In the terms agreed upon, it was fully understood that the city was spared: and that until the general question, of the demands made by our Government on the Court of Pekin was fully settled, any attempt to re-arm would be considered an act of hostility, and meet with immediate punishment. Yet they have fully carried out the first part of their threat, and very shortly will prevent shipping coming above the second bar. It has now but four fathoms at high

water, and the channel can very easily be blocked, as the water has free escape westerly by the base of the second bar pagoda.

SUPPLEMENTARY MEMORIAL TO THE PRECEDING.

"Further, your slaves, Yishan, Lungwan, and Yangfang, received your sacred Majesty's special commands to lead a body of troops to Canton, to attack and exterminate the English rebels: and your slaves Ahtsingal, (the Tartar general of the garrison,) Ke Kung, (the viceroy,) Eleäng, (the lieutenant-governor,) and Yusoy, (the too-tung or Tartar lieutenant-general,) had alike with us a share of the responsibility of holding out the provincial city; there was not a day that we did not consider how we might massacre utterly this hateful brood, *thereby manifesting the majesty of heaven*, (i. e. China,) *and gladdening the hearts of men*. How then should we dare to act (apparently) in opposition to such sentiments, and bring forward plans for temporary expedients? Alas! this arose wholly from the necessity of our position; we could not possibly help it. And we cannot do otherwise than lay before the holy lord the feelings of bitterness that now swell our bosoms.

"There are eight serious difficulties in the way of defending the city of Canton from attack, which your slave Yangfang, on a previous occasion, laid before your Majesty in a secret memorial; and when we, your slaves Yihshan and Lungwan, arrived

afterwards in Kwanghing, we found that on the right side and on the left, the throats of our communications were already in the hands of the enemy.

"On going up the stream of time, we find that Canton has carried on commercial intercourse with all foreign countries for about two hundred years. The natives of Canton most thoroughly know the dispositions of the foreigners and their likings; the people who dwell on the coast, such as the fishermen, and the boat people, those who constantly come and go with the tide through our military stations, are all in league with them, and understand their language; these are greedy after gain and fond of strife. Love of country (of the Natale Solum) hangs loosely about them; therefore it is that the foreigners do not grudge expense to get them into their employment, and consequently their hearts are turned against their masters, while they are dead to us; they obey their foreign masters in all things, they convey the most secret intelligence, and there is nothing, in short, that they may not be induced to do! Although we have already caught several, and immediately executed them, yet the traces of others being obliterated in a great commercial vortex like this, there is really no way of distinguishing them. A still worse feature is, that there are those who falsely make soldiers' dresses, and imitate the badges, and enter our ranks as if they were going to battle. These perhaps run away at the first onset, (to spread a panic among our

men,) or they attack and wound our officers and soldiers! Their villanies are quite innumerable; so much so, that many of them are positive spies in our very camp! In this late affair we secretly caught several, and after decapitating them, we exposed their heads to the people by way of warning.

"On a previous occasion, your majesty's slave Eleäng, during the second moon, (i. e. after the fall of the Bogue,) had proclamations cut out and printed, in which he assured them, that what was past and gone, would be pardoned, and promised them wealth and honours if they would reform and exert themselves. Your slaves also again and a third time issued proclamations, exhorting them to renovate themselves, and promising most handsome rewards, and yet those of them who returned to their allegiance were few indeed.

"Again, our great guns by sea and land being already lost, and we having no others to replace them, our vessels of war being without sailors to man them, our land troops, whenever they approached the bank of the river to repel the enemy, being met by the fire of the foreigners, which was fierce in the extreme, those defences which we depended upon, such as mounds of earth, sand bags, cotton waste, and cowhides, though built up more than a chang (three yards) thick, being shot through, our soldiers had not a spot left them where they could set their foot. Now, although the seventeen thousand and odd troops of the imperial army who have

been appointed to defend this post, possess officers who have had long experience in the army, and both they and the common men most nobly risked their lives, yet, alas! the ground in the neighbourhood of Canton is not fitted for giving battle: it is difficult there to pitch so much as a camp, and what between the heat and the moisture, if (troops) remain there long, they are sure to have a deal of sickness; putting out of view those we left in garrison at Fatshan and Shihmun, of the rest we can only use some seven or eight out of every ten. And upon this occasion, when the foreign ships advanced in a long unbroken line, and attacked the city, our officers and people, though they exerted themselves most valiantly, and quite regardless of their personal safety, struggled hard with them for several days and nights; yet, alas! the native traitors, fanning and inflaming the minds of people on one hand, while on the other the foreign banditti, having effected a landing on the southern side, and having in their possession all the roads and heights north of the city, whence they looked down upon us, the whole provincial city was before their eyes, and the danger was indeed most imminent!

"We your slaves, having been fed and reared by the bounty of your majesty, and having further received your majesty's commands to proceed hither for the defence of the frontier, what need there for the slightest commiseration should our single lives be lost, (in the discharge of our duty;) but remem-

bering that within this city are several millions of lives, what evil have they done that they should be exposed to this poisonous influence, (i. e. the horrors of war)? Moreover, a provincial city is a most important position! in it are all the granaries, treasures, and state prisons, (of the whole province,) and these are of the utmost consequence to us! Should such an important position once be lost through remissness, difficult would it be to recover it; in the meantime, our native banditti would avail themselves of the opportunity, and start up in every direction, and the entire province would be thrown into commotion; a contingency which one cannot bear to contemplate.

"To sum up the whole, it being impossible, to all appearances, that we could have held out the city much longer, and the consternation of the people increasing every day, the inhabitants came one on the heels of another, and with much weeping and wailing, begged that we would take measures to save their lives. We, your slaves, thought over the subject a third and fourth time, and we came to the conclusion, that, if we did not make some temporary arrangement, matters were likely to get ten times worse than they were, and so, in like proportion, should we find it difficult to exculpate ourselves from our increase of crime. If, however, before making these arrangements, we had not laid a statement before your majesty, and waited the imperial pleasure before presuming to act, we beg to

assure your majesty, that it was owing to the extreme urgency of the case, which would not admit of any delay. We humbly confess that we have erred and blundered in every particular, so that had we a hundred mouths, we could not plead exemption from the consequences of our grievous crimes. We therefore beg an imperial decree that we be handed over to the board of punishment to be most severely dealt with."

SECOND SUPPLEMENTARY MEMORIAL TO THE PRECEDING.

"And further, Canton has held commercial intercourse with all foreign countries for about two hundred years, and our Hong merchants, having had dealings with the foreign merchants for such a length of time, the debts which the former owe to the latter have in consequence become very large. On various occasions the foreigners have petitioned that these might be repaid, and the different Hoppos have always at the time deprived those Hong merchants who were most deeply indebted, of their office, and cast them into prison, apportioning the claims to be paid back by the other Hong merchants in instalments, as is duly recorded. Such has hitherto been the mode of procedure.

"Now, however, the original Hong merchant, Woo Pingkeen (old Howqua) and others, have petitioned, setting forth, that 'formerly, when the English carried on trade, we (the Hong merchants)

owed them accumulated sums; and although it had been fully understood and agreed upon, that we were to pay them by instalments in a certain number of years, yet the English trade having been stopped since the year 1839 up to the present moment, we have never been able to clear off the debt. Now, having received your excellency's commands to examine how we may most speedily clear off these accounts, how dare we, under such circumstances, procrastinate in the slightest or make vain excuses? Besides our own ways and means, when strained to the very uttermost, we are still in arrears two millions eight hundred thousand taels; and as matters are very urgent, and the different tea and silk merchants have all gone away for a time, we have really no way of borrowing the money; we can only beg that your excellencies will be graciously pleased to lend us the said sum of two millions eight hundred thousand taels, out of the monies in the public treasury, with which we shall clear off these foreign claims; and we, the Hong merchants, shall lay aside the consoo fund arising from our respective shares of foreign trade, and pay the same back by instalments in the course of four years;' and words to that effect.

"Your slaves deliberated upon the matter a third and fourth time, and it appeared to us, that, though this is merely a debt of the Hong merchants, yet at the present moment it is ultimately bound up with the question at issue with the foreigners: and

should we make the slightest mistake, (in refusing the request,) it might lead to the most fatal consequences. So we judged it best to acquiesce, and send the Hong merchants the sum required, to be repaid by instalments within the time agreed upon; and we conceive that we have good security for the ultimate recovery of the same. Therefore, without making further excuses for our own folly and rashness, we now beg to acquaint your majesty with the circumstance, having previously paid over the said sum to the Hong merchants. These claims being now liquidated, surely the said foreigners can have no further excuse to raise disturbances.

"Besides having duly advised the board of revenue, your slaves now humbly hand up this supplement for imperial inspection. A duly prepared memorial."

The Chinese language is said to abound in beautiful expressions—that its words indeed are complete pictures, all the characters composing their letters being typical. I cannot say quite so much for these translations, although I feel quite satisfied that none of the bombastic or insulting expressions have been allowed to escape.

Preparations having been completed this evening, the requisite orders for storming at dawn, and subsequently at seven A.M. the following day, were issued.

At dawn, the ominous white flag was again displayed, and for some hours there had been repeated

cries of "Elliot, Elliot!" as if he had been their protecting joss.

The truth immediately flashed on me, and I communicated my suspicions to our chiefs. They would not for an instant admit such an improbable idea; but I pointed to an officer, at that moment advancing towards head-quarters, and observed, "That officer is the bearer of our destiny."

It was too true; the officer had lost himself since ten the preceding evening, and roughed it out in the paddy fields. The despatch was read: dead silence prevailed until it was handed to Sir Le Fleming Senhouse, who immediately said, "I protest against it!" The chiefs then retired to their quarters, to deliberate on their replies. Hostilities were suspended, a sentinel posted on the hill where the general received the despatch, and the flag of truce was planted. The spot is well known as "Truce Hill."

The letters of our chiefs were despatched to Captain Elliot, but about two that afternoon he arrived at the camp.

Sir Le Fleming now lost his spirits, which before were at their highest pitch, and returned to the Blenheim, leaving me at head-quarters. He offered me the charge of the despatches, as the senior commander, but at the same time pressed the importance of our aid at Amoy; I therefore resigned in favour of Captain Barlow, of the Nimrod. The terms of the treaty are too well known to need repetition.

At eleven on Sunday the 30th, as we were resting quietly in our quarters, the muster was sounded. All were instantly in motion. The Chinese were noticed advancing from the villages in the N. W. quarter, with banners, shields, and the customary arms of the fishermen and crews of the fast boats. The 26th were advanced on the left, 37th N. I. centre, and 49th kept the heights, edging up the valley.

The heat was exceedingly oppressive, and before we had proceeded far, both the general and the quartermaster general (Major Beecher) were much inconvenienced by it. The general, however, instantly recovered, but Major Beecher was still weak, when they moved forward to a rising ground in the centre of the valley, on reaching which Major Beecher fell, and expired, from an attack of apoplexy.

A detachment of the 26th, which I joined with my boats' crew, advanced on, and set fire to their advanced post, consisting of two houses in the flat of the paddy fields. It had evidently been occupied as a barrack, as it contained numerous stools and tables. On searching, I could find nothing but two immense coffins, one at each end of the larger house, in cells apparently constructed for them. They were four times the usual size of Chinese coffins, which are generally three feet square.

The troops moved off, leaving us to set fire to these houses, which was done effectually; and just at the moment of reaching the general, two heavy explosions followed.

These coffins, I am satisfied, contained gunpowder, as the flames were too fierce in all other parts of the houses for it to have escaped an earlier explosion.

The weather, which had been for some time threatening, terminated in heavy rain, quite a deluge. About this time, Captain Knowles, R. A., dropped several rockets very prettily amongst the thickest part of a line of the enemy advancing, and these were followed up by the 26th Cameronians on the left, who pursued them from hill to hill until they reached their village. Here their powder became damp, and their fire-arms were of little use; they used their bayonets, however, to some purpose, although opposed to the eighteen feet spears of the enemy. One serjeant was shot, and several of the detachment wounded.

A spirited young fellow, belonging to one of the opium vessels, (Mr. Georges,) behaved well in this affair, bringing off the serjeant's arms and uniform, to prevent their falling into the hands of the Chinese.

The 37th, on the right, chased the enemy too far, and having separated, lost one company.

This was not made known until reaching head-quarters, when a detachment of marines, with dry percussion arms, were sent to discover them. At this time the floods had obliterated the paths, and we could barely find our way by daylight. Yet the jolly Royal Marines were successful, and found their friends in square, in the middle of a paddy field, pecked at by the Chinese spears, and nearly overpowered by

numbers. It is superfluous to tell the tale; it may readily be guessed. They brought their friends home, and "spoiled entirely many celestials." So well did the Chinese understand the use of the firelock, that one of them snatched one from a soldier, wiped the pan and fresh primed it, and applying his own match, shot the officer (Berkeley) through the arm.

This act of the marines deserved *especial* notice. It exhibited more coolness, courage, and judgment, than any advance by day against any odds.

The general, accompanied by Captain Elliot, met the Chinese rebel-quelling General Yang, and the Quang-chow-foo, in the hollow between the walls and the quarters, and had a long conversation respecting the withdrawal of the troops, &c. Hardly had they quitted before the Chinese again advanced in the valley, in number about thirteen thousand. As it was useless to trifle longer, and we would be infinitely more secure within the walls of Canton, the general apprized the Chinese authorities that if any further display took place, he should consider the truce broken, and he must adopt measures for taking possession of the city. This alarmed them considerably, and special officers were instantly sent to the turbulent peasantry, to order them to retire. Their obedience appeared for some time doubtful; the nine-pounder was ordered into position, and rockets prepared, to give them a warning dose; but they prudently retired. One turbulent leader was dis-

posed to re-light the torch of war, and how anxiously did some of the spectators look to the result!

Five millions having been embarked, and security obtained for the remainder, the force was ordered for embarkation on the morrow, the Chinese providing the necessary coolies for the conveyance of the heavy stores. I had been suffering some days from an injury on my leg, and the wetting of the 30th had increased my illness, so as to require bearers to convey me down. It was material that I should be at the beach for many urgent reasons, but particularly to give the list of the boats in their order for embarkation, my former coadjutor, Major Beecher, having died, and Captain Bourchier being in command of his division.

On reaching the Sulphur, I met Sir Le Fleming, who directed me to remain quiet until his return. This was about four o'clock, when I was considerably worse. He was very anxious that I should get down to pilot the Blenheim out; and sent Nemesis to tow me. As I was too unwell, I despatched Lieutenant Kellett to perform this duty. The troops were duly embarked, and Sulphur moved down. I was too ill to keep the deck, and without her pilot she was several times grounded.

At length we reached the Blenheim, off Tiger Island, on the 8th. I was in my cot, frequently delirious, and Sir Le Fleming too ill to call upon me. Alas! we never met again! By his late clerk he sent me a confidential order to refit immediately

for Amoy; and on the 10th I found myself at Hongkong.

On the morning of the 13th I was sufficiently well to enjoy the view from my cot, and had my port removed, to watch the Blenheim come to anchor. I had scrawled a few words to Sir Le Fleming, and just entrusted them to my purser (his late clerk) to deliver. As she anchored, I perceived signals flying, and his ensign dropped. I had been previously apprized that he was very ill, and the painful truth at once became apparent.

Shortly afterwards my kind friend Captain Bourchier called on me, and related to me the melancholy details, and it was gratifying to me to learn that he maintained, to the last moment, that devotion to his profession for which I had so much admired him.

This was the severest loss we had hitherto sustained. Had Sir Fleming lived, I am confident that the losses of men, officers, and wear of squadron, would have been much lessened, and our next despatches would have been dated from Amoy or Ningpo. His last words at parting with me on the 1st June were, "Lose no time in getting down and refitting. I shall send you and Starling to remain at Amoy with one of the sloops. We shall shortly be with you."

It was the wish of Sir Le Fleming Senhouse to be interred at Macao, and he was accordingly conveyed thither in the Nemesis, and buried with full

military honours, in the presence of all the captains and officers of the squadron who could attend. A handsome monument has been raised by the officers of the combined forces, in testimony of their respect and admiration.

Our refit proceeded but slowly; the sick list increased rapidly, and in a very short period we had no less than fifty-two incapable of performing duty. The squadron were now so much reduced by sickness, that all idea of moving was at an end; and the daily interment of troops and seamen was anything but cheering to us poor invalids.

On the 18th, the commodore returned to Macao in the Queen steamer, and having been appointed joint plenipotentiary with Captain Elliot, this was officially promulgated on the 22nd.

Various rumours of movements to the north were afloat, and doubtless any active service in a cooler climate would have lessened the mortality. I am confident, therefore, that cruizing would have checked the sickness. It is well known that in cases of cholera occurring in vessels going before the wind, it has been checked by hauling to the wind, and similar cases of yellow fever have been noticed. It is probable that the stagnant calms of Hong-kong accelerated the mortality.

On the evening of the 20th, at the moment that we were engaged making preparations for the expected typhoon, by getting on board a new anchor and chain cable, it was thought that we were too

near the Blenheim, and a party of hands from that vessel was sent to assist in removing us.

The gale increased rapidly from E. S. E. to E. N. E., and about daylight I was informed that we had driven into the hawse of the Charles Grant, a large fourteen-hundred-ton Indiaman. Being too ill to trust myself on deck, I could only command from the cabin. By breaking her sheer, and sudden veering, we managed to drive clear of her hawse, when a third anchor was let go, the best bower having at the same moment parted.

She continued to drift towards a rocky islet known as Green Island, and by the glimpses we occasionally had of the land, we were not far from it. Our last anchor, and new cable, alone held us. At this time the gale was at its height, and the sea clearing everything before it—over all, and through the hawse-holes, compelling us to batten down.

With the danger under our stern, I was asked to cut away the masts. But as I considered that the bow guns and foremast would lighten her sufficiently, orders were given to throw the former over, and after clearing away the rigging, to watch the opportunity of cutting away the stay on the roll to starboard. These orders were not attended to; every one commenced cutting where he thought best, and the result was, that we lost all our masts, by the foremast falling in board, and the mainstay having been cut. The ship immediately felt the relief.

As the gale abated, that morning, we perceived that we were too close to Green Island ledge, and that much damage had been sustained by the fleet.

Some of the merchantmen were totally lost, transports, &c., stranded, and several in the same plight as ourselves. The Royalist, our newly purchased barque, (of war,) had lost all her masts, and the Starling was missing.

About eight, I perceived, through my cabin windows, signals of distress on the island of Wanchow, and sent a boat to the Cruizer, to request their assistance, our working boats having been put *hors de combat.* About noon, the Atalanta and Nemesis were despatched to look after missing vessels and bring off their crews. Our anxiety became very great for our consort, the Starling, and every eye was strained during the day to discover her. Several times fancy had deceived us so far that we had made out her wreck, tents, &c., on the beach. At length a schooner was seen coming through the Cap-sing-moon, and, to our great relief, the Starling showed her number.

On Kellett rejoining, I found that she had parted, run through the Cap-sing-moon, made her guns fast to the cable, and rode it out under the lee of the high land.

Hardly had our fears been relieved upon this point, when we noticed an unusual movement amongst the steamers and corvettes, &c., and soon learnt that the Louisa, having on board the two plenipotentiaries,

had quitted Macao in company with the Hebe, on the night of the 20th, to return to Hong-kong, and had not since been heard of. The Hebe had been dismasted and returned to Macao, and the officers came over in another vessel.

A little exertion, I imagined, might benefit me; I therefore went on board the Blenheim, to Captain Herbert, to offer my services in one of the steamers, when I learned that they had been wrecked on one of the southern islands, but for a ransom of three thousand dollars had been safely landed at Macao. As removal to Macao would benefit the crew, by sending them to hospital, the Atalanta was directed to take us in tow immediately, and assist us into the Tepa.

We quitted Hong-kong about noon, and reached the mouth of the Tepa at eight that evening, when the steamer having grounded, compelled us to anchor for the night. Here we were just in our own draught, two and a half fathoms over soft mud. Another typhoon came on, but did us no damage. We were not more than a cable length from ugly rocks astern, but I had great faith in our new anchor and cable, and had lashed two anchors together to remedy that lost; in addition to which we had no top hamper to bring any strain on them.

On the 27th we warped to our anchorage, and I then paid my respects to the plenipotentiaries at Macao, and heard the history of their sufferings. Their treatment by the Chinese was, as usual, bar-

barous in the extreme. It appears that, shortly after landing from the wreck, they were providentially recognized by a boatman belonging to Macao, who took them under his protection (?) On opening the village, the usual cry of "Fanqui! Fanqui!" was set up, and the men rushed forth with threatening gestures, armed with bill-hooks. The guide, however, soon explained matters, and they were allowed to move forward. At length they commenced rifling the party, and as some oposition was offered, bill-hooks were raised, and the commodore and one of his attendants were knocked down, and stripped. Resistance was vain. At length they were housed for the night, and Captain Elliot agreed to give the boatman two thousand dollars to land them at Macao.

A Chinese vessel had been wrecked about the same time, and all the crew were destroyed, and their bodies frightfully lacerated. This raised a suspicion that they had not met fair play. It was not without the greatest difficulty that they could be appeased, and had it not been for their friend the boatman, they would inevitably have been sacrificed, as the people frequently returned to the subject, and went through the motions of sharpening their knives, and making signs of cutting their throats. This doubtless was in aid of the demand for the other thousand dollars, which sum was eventually agreed on.

They were to depart in two boats, at daylight on

the 23rd, and but two in each boat; the remainder were to be sent for on their reaching Macao. One hundred dollars was also demanded for each of the boats. Further extortionate demands were made, until at length, as they put to sea, their demands increased to two hundred.

On their passage they were suddenly concealed, and a mandarin boat passing close alongside, asked several questions, and passed on. What an escape! What a prize they lost! Shortly after having opened Macao, they met a Portugese Lorcha, and eager to be relieved from further durance, sprung up and waved to them. Those in the Lorcha, alarmed, and mistaking them for pirates, drew up under arms. However, they soon explained matters, and were carried into the inner harbour, where they landed at the Bar Fort.

Captain Elliot wore a Manila hat, a jacket, no shirt, a pair of striped trousers, and shoes.

The commandant of the fort wished to turn out the guard for the commodore, but this was dispensed with. They were soon in better quarters, and better rigged, enjoying a comfortable meal. What must have been the state of poor Mrs. E., who must have given up her husband as lost!

Strange adventures seldom happen singly. During the moment of my visit to the plenipotentiaries, a card was brought up to Captain Elliot, and the servant wished to know if the person could be received. This was no other than a brother of Captain Elliot's,

who, being bound to *Singapore, from Sydney*, New South Wales, had been compelled to put into China, and had passed them in their passage from the island.

We found it quite impossible to obtain masts at Macao, but fortunately Captain Kellett was able to purchase a fore and main-mast from one of the wrecked vessels for seven hundred dollars, and the stumps of our old foremast served to tongue the mizen-mast. A party of Chinese artificers were engaged, and we very shortly had a small dockyard in full energy, on one of the reaches within pistol-shot of our anchorage.

The Chinese are excellent workmen, but are not so expert (when hired) as Europeans. When compelled by their authorities to work for government, they can even astonish *us*. But nothing will induce them to move out of their established routine, or work beyond the hours of six A. M. and P. M., and during these *nominal* twelve hours, not six hours' work is performed. Our progress, therefore, was tediously protracted; and although my recovery chiefly depended on remaining quiet at Macao, I found my presence necessary during the greater part of the day in the Typa.

CHAPTER VII.

Arrival of Admiral Sir W. Parker and Sir H. Pottinger—Distribution of the force—The Chinese re-fortify the Canton river—Sulphur detained at Macao—Arms clandestinely supplied to the Chinese—Madagascar steam-vessel wrecked—Feelings towards the English — Various boats in use — Quit the China waters—Return to Singapore—Climate—Geology—Malacca —Pinang—Acheen—Malays—Conduct of the Sultan—Observations.

CHAPTER VII.

On the morning of the 10th, the Hon. East India Company's steamer, Sesostris, was observed at anchor in the roads, bearing the flag of Rear-Admiral Sir W. Parker, K. C. B., and having on board his Excellency Sir H. Pottinger, Bart, our new and sole plenipotentiary. The Nemesis immediately proceeded to her, as the depth would not allow so large a vessel to approach nearer, and by eight o'clock Sir H. Pottinger, Sir W. Parker, and their suites, had landed under a salute from the battery on the Praya Grande. They immediately proceeded to call on Major-General Sir Hugh Gough, who happened to be staying for a few days for the benefit of his health at the house of Mr. Matheson, and then proceeded, accompanied by Captain Elliot, to wait upon his excellency the Governor of Macao.

I was received very kindly by Sir William Parker, and was assured of accompanying the expedition, if the ship could be masted and re-manned in time. He remained until noon, when, having given general

audiences, he departed for Hong-kong, to hoist his flag.

On the 12th he returned in the Queen, to make some necessary arrangements, and to afford Sir Henry Pottinger an opportunity of inspecting that vessel, which was ordered to be fitted for his accommodation.

On the appearance of Sir W. Parker at Hong-kong, that place soon presented a scene of unwonted activity. A certain number of transports were placed under the supervision of the captains of the line-of-battle-ships and frigates, and every exertion was made for the earliest departure. On the 9th day after assuming the command, the fleet moved from Hong-kong, bound for Amoy.

Previous to quitting Macao, the Quang-chow-foo came in great haste, to obtain an interview with our new plenipotentiary, and probably endeavour to ascertain to what extent they might calculate on his forbearance. He was not received by Sir Henry, but, I believe, saw Major Malcolm, and finally transferred himself to Captain Elliot. This was the first blow to mandarin pride, and rather astonished the high officers at Canton, as well as the tradesmen and lower classes in Macao, who did not fail to talk it over frequently.

Finding it impossible to get manned or rigged in time, and the greater part of my crew being in hospital, I was left in charge of the British interests at Macao, there to await further instructions.

Previous to final departure, the Nemesis conveyed Major Malcolm to Canton, where he delivered letters for the Provincial government, probably announcing the appointment of Sir H. Pottinger as her Majesty's Plenipotentiary.

Captain Nias was left in command of the force in Canton river, having under him at Hong-kong the Herald, Alligator, Hyacinth, Royalist, and Hebe tender. At Macao, Sulphur and Starling.

The Atalanta was assigned to convey the commodore, Sir J. G. Bremer, K. C. B., and Captain Elliot, to Bombay, in order to proceed home overland. They embarked on the 24th. The Sulphur might perhaps have done better had she put to sea, and found her way to Singapore, as there was not the slightest prospect of her crew becoming effective even, if they were immediately returned to duty.

Notwithstanding a special proclamation, declaring that any attempts to re-arm the batteries, or impede the navigation of the river, would be treated as acts of hostility, the imperial rebel-quelling general, and his colleagues, immediately set about repairing their defences, constructing new batteries, and effectually closing the approaches to Canton.

Another memorial appeared, in which they state that the English foreigners (no longer rebels) have left the provincial river, have given back the forts, and that the militia and volunteers have slaughtered a great many native traitors, and *foreign (?)* robbers who were raising disturbances; and that they had

restored quiet to the provincial city; that they had *commanded* that the English ships should forthwith get up their anchors and depart; that the said foreigners immediately got more than ten sail of their ships under weigh, and left the river when one of their commanders, Warren, petitioned, saying, that the real fact of the matter was, the foreign merchants of every nation were very hard pushed for money, and worrying him for payment of their debts; that they had no intention whatever to *offend*, or commit any act of aggression upon the heavenly dynasty, and *implored* us to supplicate the great emperor to show them mercy, and pardon their offences. *(Very like Warren!)* "Your slave finds," it continues, "that the foreign ships on this occasion *bolted* into the river by violence, incited by the native traitors showing them the way;" (query Sulphur's?) with other trash. They then finish by stating that having captured two hundred native traitors and foreigners, black as well as white, among which last were two *chief persons*, they should be beheaded at Namoan. One of the two chief persons was stated to be Bremer, and that the English were willing to pay one hundred dollars to ransom the body, which they had stowed away in a secluded house, and which they intend to inquire into.

Can all this be credited by those who maintain the Chinese higher classes to be a polished nation? They are indeed the most polished rogues under the sun; and I am informed that this nephew of the

emperor, Yishan, is one of the most grossly reprobate characters that has entered Canton.

The fleet having proceeded to the capture of Amoy, Ningpo, Chinhae, &c., as we were not eye witnesses, I must refer my readers to the Gazettes for particulars. Amoy fell on the 26th of August; Chusan on the 1st of September; Chinhae on the 10th; and Ningpo on the 13th.

Our duties, in addition to those customary to ships in port, were particularly directed to the suppression of supplies of ordnance, small arms, and ammunition to the Chinese. These were imported into Macao, *nominally* to Portuguese merchants, but sold to the Chinese, and shipped off by night to Canton. The importations were in British vessels, and I wish I could have the satisfaction of clearing my mind from the conviction that British agency was not actively interested. The embarkations took place at the ports of Madras and Singapore. Unfortunately I was too late in the case of the Sesostris, or I should have detained that vessel until the decision of the Admiral authorised their being landed. They were landed at the Custom-house, and so much had been said about them, that during our stay they were not removed. Indeed, I kept a constant guard over them, day and night, and had they been found in a Chinese vessel, out of the waters of Macao, they would have been instantly captured.

Having been ordered over to Hong-kong upon

some trivial duty, and given the guard, the Sesostris evaded our guard-boat, and as I had been informed that she had muskets and ammunition still on board, we were despatched to examine her. We found her at Whampoa, but the search was fruitless.

During my stay at Whampoa, I learned from several gentry just returned from Canton, "that the Chinese had effectually staked the river at Howqua's Folly, and that even boats passed with difficulty." No measures were taken to examine the other channel; indeed, Captain Nias had given me express orders "*not to look into these matters.*" It is not probable that Canton will again be approached by our ships, unless nature makes some violent effort to clear a new channel.

I hear it constantly observed that "the wet season will carry all before it." When does this wet season occur? We have now been within Canton river since the 13th of December last, and have not witnessed any extraordinary freshes, nor anything approaching the power alluded to.

That a channel would very soon be opened if required, I should be very sorry for one instant to doubt, and I should be too happy to prove the question. "Impossibilities" of such a nature do but sharpen one's wits.

I was surprised one day by a note from Mr. J. Matheson, announcing his wish to see me at Macao; and still more so, on my arrival at his house, at the perusal of a letter from Captain Dicey, of the late

Honorable East India Company's steamer Madagascar, which had quitted me but a few nights previous, bound to the north, and having on board my old friend Captain Grattan, 18th Royal Irish, charged with despatches for the plenipotentiary from Lord Auckland. It reported their wreck near Namo, with himself, Captain Grattan, twelve Europeans, and thirty Lascars, and begged for assistance. It further stated, that they had called themselves Americans, in order to prevent their immediate massacre, or until they fell under the protection of a mandarin. So far, perhaps, their lives were saved; but it is deeply to be lamented that so soon as they found themselves in the power and under the protection of the mandarin, who *evidently knew* that they were English, they did not declare their true colours, and call upon their own country for interference. Still it is difficult to decide how the *majority* would act under the pressure of the moment, and probably without much time for consultation. Doubtless, there were individuals of the party high-minded enough to sacrifice themselves without hesitation, to a sense of honour, but they might feel considerable difficulty in involving forty-one others, who must inevitably share his or their fate.

Everything which could be done under the circumstances was most cheerfully and zealously entered on by Mr. Matheson, one of the most spirited as well as influential merchants at Macao. Nothing, however, can be done expeditiously (short of losing

life) in China, and we had, therefore, patiently to await the result of the system adopted.

Society in Canton appears to be completely unhinged, and all respect to the local authorities at an end. The feeling against the *war barbarians* also is very inveterate, and this was lately vented in an extraordinary manner against the old Quang-chow-foo, (supposed friend of the English.) It appears that Yu Paoushun, the prefect of Canton, decked with his (new) peacock's feather, proceeded, in the due course of custom and duty, to the great hall of examination, where the literary candidates had assembled for their annual exercises. On his entry, some of these high-spirited gentry became restive, showed symptoms of discontent, and eventually began to ridicule. For this they were called to order, and sharply reprimanded; whereupon the *public voice* broke forth; they became clamorous, began to hiss, called his honour a *traitor*, and hurled their inkstones * at his head. Unable to withstand such missiles, the old gentleman determined to withdraw; but on leaving the hall, one of the most daring of the malcontents attempted to break his sedan-chair. A great disturbance ensued. The Nanhae-heën, (magistrate of the district of Nanhae,) who is second in authority to the prefect, then came forward, *soothed* these excited literati, and *begged* them to come again next day

* Slate slabs for Indian ink, weighing half a pound to one pound each.

for examination, when the commissioner of justice would come to the hall. On the 18th, the prefect had resolved to resign his office, which immediately followed.*

The fast boats, war junks, tea boats, trading junks, &c., have been frequently alluded to. I therefore deem it right to insert their descriptions separately in the following order. First, "The war junk," which may be very readily conceived by supposing the wood-cut beneath, which represents the large trading junk to have guns allotted to her painted ports.

TRADING JUNK.

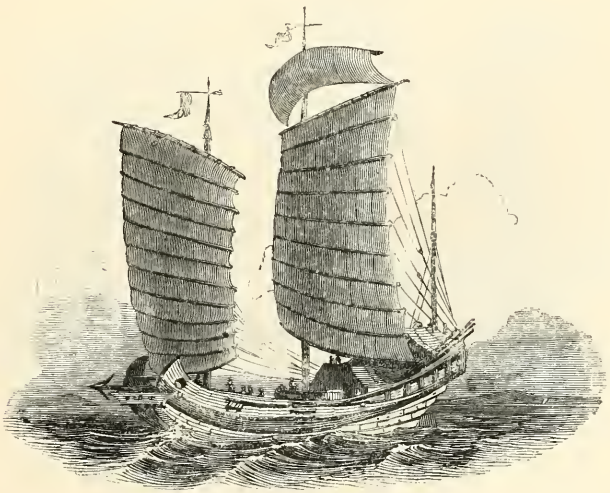
Abaft the mainmast, however, in those intended for war vessels is an arched cabin, the roof of which rises about four feet above the deck, and its deck

* Chinese Rep.

is about the same depth below the upper deck. No guns are mounted abaft the mainmast. They occupy the space between the fore and mainmasts.

The cabin arch is continued aft about ten feet, forming a deck magazine, which, of course, is very liable to accident, and any rockets striking that part of the vessel, must inevitably cause an explosion. Indeed, one may almost say that from the loose manner in which their ammunition is made up, and frequently filled as required, that a train is always laid from this magazine to the guns, which might be ignited, even by a rocket passing over that part of the deck.

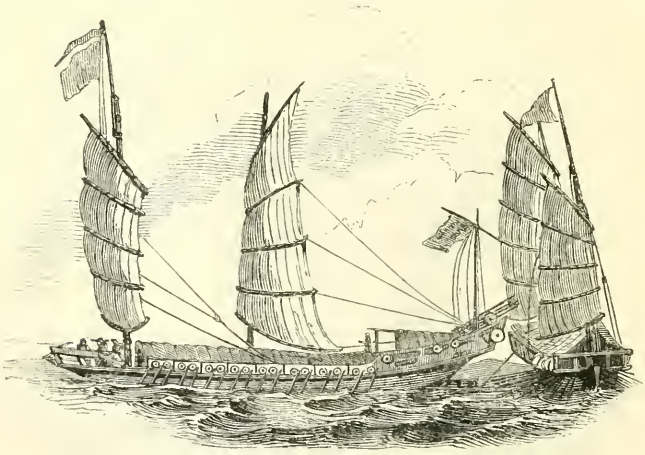
A second war junk is frequently fitted from a fishing vessel, or "salt junk," similar to the annexed wood-cut, and merely has four or six guns mounted to fire over all.



SALT JUNK OR FISHING JUNK.

The fast boat, which may be appropriately termed the war galley, varies in length from fifty to ninety feet, and pulls from thirty to sixty oars. They are fitted much in the same style as the Spanish Scampavias, being hatched, where each pair of rowers sit, and armed with one or two brass guns in the bow. They have also six or eight gingals, mounted on the gunwales, which carry a leaden ball of two ounces. The crew are dressed with short blue shirts, loose short trousers, and conical caps, the latter formed of a basket work of rattan, which resists the blow of a cutlass, and are generally painted red and white. Their shields, which are formed of the same material, and painted with various devices, are about three feet in diameter: they fancied them ball proof, but were sadly mistaken.

This same description of vessel is that used for

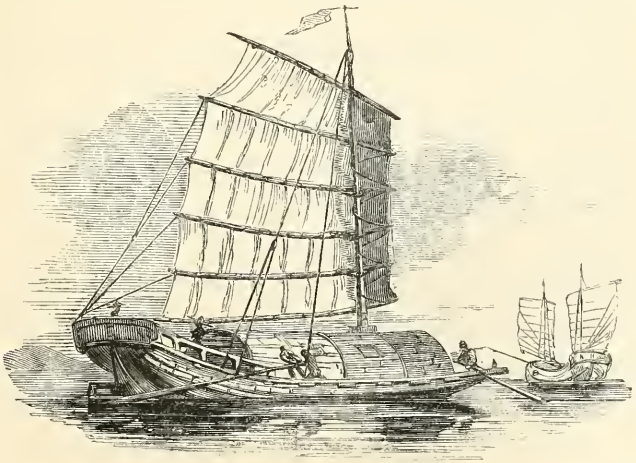


FAST BOAT OR SMUGGLER.

smuggling opium, and which frequently, from their superior class of crew, compel the mandarin fast boats to make the best of their way for shelter. The annexed wood-cut represents the vessel; the arms may be seen in the plate, where the gingal is also in use.

The " tea boat" is calculated principally for river navigation, and is generally about one hundred feet in length by twenty wide. They are fitted with a *substantially built* arched roof, having a sliding arch abaft the mast, which admits of loading. This arch slides closely in grooves, which renders it rain proof.

I found these vessels would conveniently accommodate one hundred and twenty men each.



TEA BOAT.

The sampan is very similar to a boat cut in twain with a stern fitted *inside* the planking; its greatest

breadth being at the stern, which forms a semicircle. One is shown stern on in the wood-cut of the trading junk. They are navigated by Tartar *women*, who entirely live in them at night; they are housed by a sliding bamboo arch, which is pushed back, like scales, by day.

On the 14th of November, her Majesty's ship Larne arrived from Chusan and Ningpo, bringing the lately promoted captains and other officers from the squadron, on their homeward passage. By her I received my release, with a private note from the admiral; but my little consort, the Starling, was to be paid off, her crew transferred to the Sulphur, and Captain Kellett to re-man her by volunteers from the merchantmen, and join the admiral, for surveying service.

To me this detention would perhaps have been less felt; but Kellett had so long set his heart on home and arranging his affairs, that he was anything but gratified; although it would probably ensure his further promotion. His separation from me was a still greater blow, all our operations for the last six years having been carried on so entirely in conjunction, that they could only be unravelled by our united efforts; and as he was my only actual assistant, I was thus left burthened with the whole labour of the expedition, as well as our Chinese surveys, which even our united endeavours could not possibly "lick into shape" before the return of the ship; independent of the necessary writing and calculations.

But the fiat had issued, and it was idle to repine. It was perhaps of equal, if not of more importance, that his services should be available during the present opening of China. I therefore determined, in compliance with the admiral's wishes, to render him as complete as either public or private means would admit, for his own cruize, and made up my mind to the separation. To those only who know how much we were together, or in communication, since 1831, can this feeling be understood.

Having rated our chronometers, and obtained our final observations at Macao, we took leave of our kind and hospitable friends, and wishing "better luck still" to our nurseling, now left to shift for herself, quitted, on the 21st of November, with a strong breeze from the northward.

After having passed Pulo Sapata, the breeze falling light, we hauled to the westward, ran over the Charlotte bank in fifteen fathoms, and were driven by light airs and currents over to the Anambas, on one of the islands of which (Pulo Domar) I landed, in order to secure its position, which agreed pretty well with that assigned to it in the charts.

The islands, I since find, have been very closely surveyed by the French expedition, under Laplace. The rock, or island of Domar, (? Pulo do Mar, of Portuguese origin?) is a lofty limestone elevation, of one hundred and fifty feet, and in fine weather, safe and convenient landing may be found on its south-

east extremity, where also a small coral beach, at high water, will admit of beaching a light boat. At low water, my gig without her crew could barely reach the nearest rocks.

Nothing worth notice occurring here, we shaped our course to weather Pulo Aor, and sighted it, bearing away for the straits of Singapore.

On the following morning we found ourselves drifted far to leeward on the Bintang shore, and were unable, by reason of light baffling winds, to reach into the straits until the evening of the 4th of December, when, with a fresh breeze at N. E., we passed over the tail of the bank off the Romania Shoal, and by dawn the following morning reached close off Singapore.

On the master attendant visiting, I learned that my good friend the governor (Mr. Bonham) had embarked in a merchant ship, in order to visit Pinang, and other parts of his government, and was then underweigh, departing. After paying him my farewell visit, we anchored about eight, in the roads, where I found the United States frigate Constellation, 38, bearing the broad pendant of Commodore Kearney, and the Boston corvette, Commander Low, on their way to Manila and China, and at this critical moment of dispute with America, not very opportune visitors. However, being in a British port, they were guests, and I lost no time in calling on them, and was much pleased with their acquaintance.

I took up my old quarters at the recorder's house, and had the satisfaction of finding, after twelve months interval, that my instruments continued to afford satisfactory results. Since my last visit, my good friend Lieut. Elliot had completed his observatory, and had been now nearly a year in activity. As not a letter for any individual on board was received here, it was a rich treat to be able to talk over with him all that had been done, was in progress, and talked of, during our almost banishment.

I also had the pleasure of making the acquaintance of Mr. Ballister (the American consul) and his wife, and in company with the commanders of the American vessels of war, passed a very agreeable day.

On the day we arrived, the Medusa, Hon. East India Company's steamer, was noticed outside, and coals having been sent out to her, she paddled into, the anchorage.

This vessel, with the Ariadne, of similar construction, quitted this port some time since, to join the fleet in China. They reached within two hundred miles of Manila, when their coal being expended, the Ariadne was signalled to return to this port, and the Medusa reached Manila. There she obtained a small supply of refuse coal and wood, and made an attempt to reach Macao. She was in *sight;* but having burned all her bulwarks, fittings, &c., and having no anchors or cables sufficiently long and strong to hold her in deep water, she bore up for Singapore. The Ariadne not having appeared, she

was deemed lost, and as the present season rendered it impossible for the Medusa to make a second attempt, as well as orders from the governor general having arrived to recal her, she was refitted, and sent to Moulmein, to join the force watching that port. The Ariadne subsequently reached Manila, having obtained wood in Borneo.

We were detained some days at Singapore, waiting for bread, which could only be baked (by the Chinese) at the rate of one thousand pounds per day, and the American ships, supplied by the same parties, were also detained for the same reason. Although a free port, and abounding generally with stores, there are but few fit for a ship of war. No cordage fit to reeve could be found; which, considering the great influx of ships connected with the China expedition, rather indicates want of judgment in the merchants, as I am satisfied large sums would have been realized by shipping it on to Macao. European rope at one period fetched as much as twenty dollars per pecul (of one hundred and thirty-two pounds;) spars fit for mainmasts of vessels of five to six hundred tons, twelve to fifteen hundred dollars each. At the moment that we were in distress for masts, I examined a junk's mast, offered for sale, which would not make us either fore or main mast, but for which they asked twelve hundred dollars.

On receiving our unexpected orders here last year, we were unable to procure any articles of refit for our wardrobes, and eventually obtained them

at Macao. These are points which all travellers or voyagers bound this way should be apprised of. It is possible that these wants may soon be remedied, and probably an overstocked market will be the result.

The climate of Singapore is reckoned warm, but particularly healthy. Although nearly on the equator, invalids from other tropical regions frequent this spot. The temperature seldom ranges above 82°, during their cool or rainy season. But this term is scarcely justifiable, seeing that the rain merely falls in showers, and seldom exceeds half an hour in duration; they are, indeed, merely refreshing showers. The average fall of rain during the year is ninety inches. February, March, and April are considered the hottest months; April until October those liable to rain,—when, for the instant, it descends in heavy volume.

The formation may be considered granite, iron and red sandstone, and vegetable matter mixed with coralline debris. This latter occurs particularly in the region where the magnetic observatory is situated, and as far inland as where the American consul resides, and in all probability is the cause of the earlier putrefaction of the water in wells or stagnant pools. Lumps of scoriaceous iron present themselves here and there, evidently exhibiting some violent convulsion, which has entirely upset all attempts to pursue stratification.

The soil produces sugar-cane, cotton, coffee, pep-

per, cloves, nutmeg, betel-nut, cinnamon, cocoa, maize, pine-apples, (a perfect weed) plantains, figs, and the usual kitchen garden produce, which the Chinese rear very plentifully.

The customary conveyances are palanquins, drawn by ponies, as well as gigs, and open phaetons, &c., belonging to private individuals. The customary hire of the palanquin is one dollar per day.

The town contains three hotels. That most frequented, and maintained in the best style, is kept by Mr. Dutronquoy. It is in exterior more like a palace than an inn. There are table d'hotes and conveyances provided. Expenses are similar to those of all hotels out of England: dollars here are as rapidly consumed as shillings in England. The residents are extremely hospitable; they generally dine at four, and little formality is observed. The fashion indeed prescribes white jackets, and the punkah is as indispensable as in India. Meat and poultry are expensive, for the country, being dearer than in our English markets.

Water is supplied to the shipping by tank-vessels, at the rate of one dollar per ton; beef at eleven and a half cents; biscuits, four and a half cents; fuel, three and a half dollars for one thousand billets.

Late on the evening of the 17th December, we quitted Singapore with very light airs, and having rounded Barn Island, anchored until daylight. As soon as the tide permitted, we moved on; but at a very slow pace, and did not reach Malacca until

the morning of the 20th, when we anchored about eight o'clock in three and a half fathoms, close off the fishing stakes, and most fortunately succeeded in obtaining a suite of observations, which detained us until midnight.

I called on the resident councillor, Hon. Mr. Salmond, and as my time did not admit of dinner parties, devoted an hour to tea and conversation. Every civility was tendered by the residents; but as our visit was purely to obtain the magnetic data and meridian distance, delay was out of the question.

At four A.M., we weighed, and quitted Malacca, not without regret at our inability to accept or return the civilities proffered, or to make an excursion into the interior.

Malacca is very prettily situated on a well-wooded mound or clump, on the summit of which stand the fort, signal-post, and stadt-house; the other houses surrounding the base on its outer or southern segment, extending about half a mile in distance, and skirted by villas right and left. The river divides the town at the base of the stadt-house, or governor's residence. It is navigable at high water for small vessels, but at low water boats cannot approach within half a mile of the beach, by reason of the mud flat.

Light baffling airs did not permit our making much progress, and during the calms the dredge obtained us many very interesting objects in conchology.

On the 26th of December we sighted Pinang, and on the night following, having despatched the master ahead in the gig, to show lights on the requisite spot, we anchored in ten fathoms, about ten P. M., off the admiral's house.

On the following morning, we were visited by the master attendant, and at eight I landed at the Admiralty-house, which I found occupied by our kind friend Mr. Bonham, (the governor of Singapore, Pinang, &c.) until his house was vacated by the resident councillor; I therefore became his guest, and made my arrangements for completing my observations in the garden of that establishment.

As Pinang has been so often described by former visitors, I shall dwell but shortly on it beauties. The town is situated on a low delta, the northern face of which is occupied by the fort, Admiralty-house, and private residences; and the eastern by the town. The sides of this delta occupy about two miles on the sea faces, and perhaps more on the land from whence the mountains spring. This level triangular space is traversed by most excellent roads, well sheltered by trees of luxuriant growth principally of the cocoa-nut, betel, palm, and bamboo. It is customary to drive out on these roads between the hours of four and seven, terminating usually at the jetty or promenade, at the eastern apex of the triangle, to talk scandal, &c., until seven, the customary hour for dinner.

The town contains the usual well-built public offices,

shops of all trades (chiefly Chinese) innumerable; with the addition of the usual quantum of filth, &c., which one generally encounters wherever the Chinese are located.

On new year's day I accompanied the governor on a visit to Mr. Garling, (the resident councillor, or governor, in the absence of Mr. Bonham,) residing at Bel Retiro, the government house, or proper residence of the governor, which occupies the second hill in height on the island.

We quitted the Admiralty-house about half-past six in the morning, in a palanquin carriage, which conveyed us to the foot of the hill, where we mounted our steeds, stubby ponies, about fourteen hands high, not much inclined to move out of a snail's pace. The road was very steep, and the exertion of keeping the saddle for one hour up so tedious a zig-zag path, was infinitely greater than walking. However, as I took with me a mountain barometer and other instruments, the motion was certainly easier on horseback. About eight we reached the summit, where we found a most agreeable temperature of 71°, and a still more agreeable party to welcome us.

The whole house, or pair of houses connected by a covered way or open room, about one hundred and fifty feet in length, was most tastefully decorated with flags, wild flowers, and painted devices, by the younger damsels; also with native flowers of the island. The devices were chiefly complimentary to

their kind and worthy host, Mr. Garling. I really began to fancy that we had approached home somewhat suddenly, and the kindness and attentions of our host's lady and visitors very soon made me forget that I was still a wanderer. We remained the night in this delicious retreat, (dancing until eleven,) and enjoying a temperature of 66°,5; and at daylight commenced our descent.

Bel Retiro is situated two thousand five hundred feet above the level of the sea, and perched on the second highest of the several nipples which crown this range, and on most of which are snug little retreats, forming sylvan palaces. It commands a very extensive view, but, from its elevation, is subject to frequent visitations of fog and rain, which to those unaccustomed to dwell in heights must be visited to be appreciated—*felt* would be a better term; a fog being literally a vapour-wave, pervading horizontally, and only to be kept out by closed doors and windows. The signal-post is situated on this hill, within a very few yards of the house.

On a hill, not much beyond musket range beneath, but which took longer to travel, is situated the house of his Honour, the recorder, to whom we paid a visit, as well as to other beauties surrounding this agreeable retreat.

After experiencing much kindness and attention from Mr. Bonham, I took my leave on the night of the 3rd of January, aided by a fresh land breeze which carried us clear of the land before midnight.

Our course was shaped to sight Pulo Pera, which we passed within four miles on the noon following. Here the breeze slackened, and we floundered through calms and rains, until noon of the 6th, when we made the N.E. angle of Sumatra, near Cape Diamond. Had the weather been propitious, it was my intention to have fixed its position, but this was now given up.

As we were just in one hundred fathoms of water, and becalmed, the dredge was put over to try for anything living at that depth. We were particularly successful in obtaining live specimens of terebratula, chama, minute shells, echini, and asteria; temperature of sea at surface 82°, eighty fathoms below 55°.

Light baffling airs prevented our progress until the 9th, when we reached Pulo Bouro (or Malora of the charts) at sunset, and fearing some loss of time or difficulty in landing at Acheen, I examined the island, and finding it suit my purpose, anchored in order to secure the meridian distance, as well as making it my main position for fixing the Golden Mountain.

At our anchorage the current was found to set one and a half mile per hour west until midnight, when it changed, having the same velocity, to E.N.E.

On the morning following we landed, and having completed our observations by sunset, bore away for Acheen, distant about ten miles. We anchored for

the night, but shifted as close in as safety permitted the following morning, or within the influence of the river current, which perceptibly discoloured the sea, and although distant about three quarters of a mile from its mouth, the water was fresh on the surface within a cable's length of the ship.

The entrance to the river is very shallow for two hundred yards from its mouth, and at its deepest part on the bar, has only three feet six inches at low water. As the flood never overcomes the force of the stream, although the level rises, a constant series of overfalls or small rollers result, tending rather to cause doubts in strangers as to the safety of landing. This, with chronometers and valuable instruments at stake, became matter for consideration. For this reason, I deemed it prudent to transfer the more important articles to a larger boat, and move in with my gig, (a very full whale boat,) and if safe, signalise the cutter to follow. On entering these petty rollers, I found that they assisted us much in our progress against the swift current, and once within the bar, that we were quite in still water.

Having a letter for the sultan of Acheen from the governor of Pinang, stating the object of our visit, I had determined on delivering it; but finding the distance to his town great, the stream rapid, and moreover, time precious, I was glad to put off this ceremony, despatching it by one of his rajahs. Our signal soon brought the boat in, and the tents, &c.,

were pitched upon a low sandy point, unfortunately containing a large proportion of iron sand. I was visited shortly by a rajah, by whom I was informed that I might expect a reply in the evening.

A Moulmein vessel, commanded by a Portuguese half-caste, happening to be in the river, I was fortunate enough to obtain his services as an interpreter. In the evening, one of the sultan's household visited us, with a message from his master, as well as a present of a bullock and some fruit for the ship's company, also intimating that "the sultan would be glad to see me, and that orders had been given to see our wishes attended to on the beach." A message was returned, that I would visit him on the morrow, before noon.

Fortunately, although surrounded by these half pirates, who were, from the boys upwards, armed with kris, dagger, or scymitar, (the latter used for hatchet or any other purpose, and a very formidable weapon,) we were enabled to keep them at a very fair distance, and found them less troublesome than more civilised nations,—who, knowing the inconvenience of causing the ground to vibrate, or approaching the magnetic instruments with weapons or iron, would frequently intrude or walk about, to our manifest discomforture. Indeed, I have generally found that a lead line marking the boundary of approach, has been more efficient than the armed sentinel.

Having remained on shore during the night, and

completed the necessary series of observations before nine the next morning, *malgré* the torture of myriads of mosquitoes and sand-flies, I set off in my gig, accompanied by the surgeon and our interpreter, to pay my respects to his highness.

For the first mile we found both sides of the river marshy, and the river itself, which is about sixty yards across, obstructed by sand knolls; but passing these, the banks at the sides of the river become firm, of solid red earth or clay, with well-beaten footpaths within a few yards of the banks. The scenery is picturesque, with several spots of cleared level ground, and detached grassy islets.

About two miles from the entrance, where the large trees overhang the river, we noticed several large buildings, and were hailed by the sultan's man of business, who visited us yesterday, and who beckoned us to land at a small country or summer-house belonging to his highness, where he had appointed to meet us.

We were ushered into a small divan ascended by a flight of steps, which strongly reminded one of a warder's post, being situated immediately above the gate. This appeared to have been recently fitted up with shawls, rugs, and pieces of old finery, for the occasion. The state-chair, intended doubtless for his highness, had a worked crimson seat, embroidered with tinsel and pieces of looking-glass, intended probably to represent jewels. In the main square stood a very respectable house, in the Moorish

style, of three stories, with very wide eaves to each, decreasing to the upper, which might be one fourth the capacity of the ground floor. This, doubtless, was their mosque, as at the time of prayer we saw them wash at the adjoining cistern, and return to the lower building, which they told us was for prayer. The persons who showed themselves at the upper windows, we were informed, were soldiers. Other offices completed the square, in which the retinue of all descriptions appeared to have some particular station. That on the right was occupied entirely by children of his royal highness, and not a scanty brood, considering they were only the males.

These appearances gave me but a poor idea of the state of this prince, and as I had arranged matters to return to my observatory again before three, I began at noon to be rather impatient at the neglect of his royal highness, and more particularly at the want of dinner for my boat's crew, which I had fully calculated on being properly entertained. Upon expressing my anxiety upon this subject, I was coolly informed that his royal highness *might* be down about four o'clock, after prayers; I therefore decided on going to him, and thus obtaining a sight of the town. We accordingly pulled up the river, which presented no further variation than a few cleared spots on the banks.

Arriving at a small creek, pointed out by our guide as the nearest landing to the village, we walked a short distance through roads and grass,

rather miry from rain, which was then falling, until we reached the bazaar on the outskirts, which did not seem either to be well supplied, or to offer anything very tempting. Passing this, we at length came to the entrance gate of the sultan's grounds, which exhibited in the smaller doorway a brass six-pounder field gun. Here we were forbidden entrance, and as it rained, were offered a shed for shelter, which was already fully occupied by a set of dirty idle fellows, mixed with the *guard*, in their turbans of crimson woven with gold cord, and probably awaiting their master's movements. This, however, I thought too great a degradation, and accordingly declined.

Finding that they closed the gate, and intended keeping us waiting, (how long seemed doubtful,) I sent a message to his highness, acquainting him that as I had come to visit him, and he had not the civility to afford me proper shelter from the rain, I should return to my ship.

Indeed, I saw no friendly disposition evinced by his people, and as the act of making me wait would gratify them,—and I had before been given to understand that he delighted in aping the sovereign, I determined to show how little I cared for him or them, well knowing that humility would very soon appear on the opposite side.

I therefore carelessly returned, examined the bazaar, and then moved on to my boat. But just as I had seated myself, a messenger arrived to recall me,

stating that the sultan was on his way to see me. I determined not to subject myself to a second disappointment, and further I did not believe his emissary. However, to test his sincerity, I desired him to tell his master, "that if he was *desirous* of seeing me, I should meet him at his country-house where *he had appointed*, provided he was there when my boat reached it;" and to afford him full time, I drifted down stream, looking out for birds, &c., on the banks.

As he had not arrived by the time we reached the place, we passed on, landed, and shot several very handsome birds. One very beautiful species of bird of paradise, furnished with long curled feathers, in addition to the wing coverts, flew across the river, but we were unable to get a shot at it.

Whilst thus engaged, a special ambassador, attended by a large party, came suddenly upon us with fresh importunities to return; but the only answer I could give was, "that as my time was of the utmost importance to me, his highness would find me at the beach, or on board my ship, and that I begged to assure him that he would neither be denied admittance, shelter, or the hospitality due to his rank; moreover, that it would probably be the last captain of a British ship of war who would condescend to call upon him after such want of courtesy on his part."

Thus ended our communication. The chiefs on the beach paid us more attention. Fowls, &c.,

were brought for sale, and had we remained, doubtless we should have received the sultan on board. Time, however, was too precious, as we had much yet to complete at the island of Bouro. Our tents were therefore struck, and by dark we were on our return to our former position, where we anchored early next morning.

On our return down the river we called at a small fisherman's retreat, where we found their lines and nets suspended to dry. The nets were of very fine thread, very beautifully worked, and must have been the result of great labour. I inquired, from curiosity, what they would require for the one before me, about thirty feet long, by thirty yards in circumference; the reply was, thirty dollars. Labour, therefore, is not cheap in this region.

I was particularly struck with the peculiarity of fitting their fishing lines, being precisely the same method as that adopted by the Indians of the eastern coast of America, viz., by a swivel and piece of horn above the lead, which prevents the bait from getting foul. I borrowed the invention from the Indians of Nova Scotia, and although I have everywhere strictly scrutinized the peculiarities of fishing implements, have not before seen it imitated. Had we noticed it in Behring's Straits, or the northern Asiatic regions, it would not have appeared so strange, as the Malays are well known to have carried their depredations into the northern parts of Tartary, and thence it would easily have been copied into Siberia.

I thought it rather strange, that although a paper was presented by the captain of the port, stating that supplies, refreshments, water, &c., were all to be obtained, nothing could be procured until the moment of embarkation, and then but a scanty supply.

On the first day, I noticed that every person came armed, and generally dressed in full costume. But on the last day few were so accoutred.

Several lines of old encampments, as well as heavy brass guns, were observed near the beach, and one very large gun at the town, said to be of sufficient diameter to admit a man on his hands and knees. I despatched one of the officers, Mr. Selwyn, mate, to examine those immediately in our rear. He was shown a large gun, of fourteen inches bore, and measuring twenty-three feet, and several others were said to lie concealed by the jungle. It was brass, of good workmanship, and had characters on it resembling Malay; but the natives did not understand them.

Several of the chiefs were anxious that we should visit their divisions of the country, where every article of supply would be abundantly forthcoming; at the same time intimating their independence of the sultan. One in particular spoke very good English, and stated his prices, which were much more reasonable than those at Acheen. A superior rajah visited me the first day, elegantly attired. He was very gentlemanly in his manners, called himself a

lieutenant of the rajah's *but not under his control;* and wrote down my name, as well as that of the ship, in English. I wished him to accompany me the next day, to interpret, but he shook his head rather significantly; intimating that he was not ambitious of the honour. I interpreted it, disinclination to jeopardise his freedom.

Having reason to doubt our observations on Acheen sand, I determined to renew them on Bouro, where the central position on the island might afford me more satisfactory results. I found, however, that the rocks all, more or less, affected the needles, as in the case of most volcanic formations. The principal object of my visit to Acheen was completely effected, and we were unusually fortunate in such operations; having experienced fine weather, and rapid transit from station to station. By the astronomical and chronometric bases both coinciding, the Golden Mountain is situated in latitude 5°,21′,26″,5, (Horsburgh 5°,27′,0) and longitude 95°,44,′55″ E., (Horsburgh 95°,49,′0) its elevation is eight thousand two hundred and eighty-three feet above mean tide level, differing but thirty-three feet at the extreme stations.

Water is easily obtained by filling the casks within the river points; it even runs fresh to the breaker edge; but it is safer in every point of view to water inside, as the rollers are not always to be trusted.

Riding at the anchorage is very uneasy, but at

Bouro less so, if the island be brought to bear E.N.E. in fourteen fathoms. The bullocks obtained here are in fine condition; that we obtained weighed two hundred and fifty pounds. Their scymitars are made by native workmen, the steel being imported from Calcutta. They are valued at one and a half to two dollars each; but although anxious to obtain one, no one would be induced to sell, even for double their value.

CHAPTER VIII.

Ceylon—Point de Galle—Climate—Sail again—Numerous marine animals—Natural history—Anchor at Port Victoria, Séchelles—Partiality of the seamen for cocoa-nuts—State of Victoria—Black population—Description of the Séchelles from their almanack—Mahé—Monsoons—Cession of the islands to England—Terms of capitulation—Political and commercial importance—Woods—Quit the Séchelles—Majambo Bay, Madagascar—Appearance of the coast—Natural history—Absence of natives—Sail for the Cape of Good Hope—St. Helena—Ascension—Cape Blanco—Arrival in England—Liberality of the Admiralty—Paid of—Conclusion.

CHAPTER VIII.

On the 14th January we quitted Bouro, and shaped our course for Point de Galle, the southernmost port in Ceylon. Strong north-easterly breezes favoured us, with a good offing. On the night of the 17th, we passed over the position of the Bale of Cotton rock, and steered for the Basses, which we passed about six, on the morning of the 20th.

Having steered a course intended to pass close to the southernmost, and possibly fix its position if becalmed, we found ourselves at dawn about fifteen miles off shore, and had drifted considerably to the south-west: about eight, Dondra Head and flagstaff visible N. N.W., and the land about Point de Galle in the western distance. Here we were tantalized, not above twenty miles from our port, with light baffling airs, barely enabling us to stem an easterly current, as well as an offshore set.

About eight in the evening, we were visited by a fisherman, who understood English, and having ascertained that we were bound to Galle, he re-

mained by us, affording us his assistance as a pilot. By four A. M., we reached the outer anchorage, and the breeze failing, dropped our kedge. At daylight, finding that we were not more than eight miles from the shore, and that the sea breeze would not make before noon, I quitted in my gig to examine the place, and seek a suitable position for my tents.

On landing, I proceeded to call on the military commandant, Major Darby Griffiths, of the 90th, from whom I experienced much civility, and the utmost readiness to further my pursuits. The position fixed on was the space between the magazine and the rampart on the Utrecht bastion, free from guns or other iron materials ; the composition of the rocks being either entirely granite, or pure coral limestone.

I am, perhaps, tediously particular in mentioning these points ; but I have particularly felt the want of such precise information, when making a port, and it is of importance to know between what two actual points meridian distances have been measured.

I had hoped to be able to obtain a series of moon culminations ; but so uncertain was the weather, that after getting the transit into the meridian, not a single opportunity offered of getting both moon and star; and it was only by a severe attention for the whole progress of the sun from half past eight until half past ten, A. M., over every ten minutes of altitude, that I secured corresponding observations to enable me

to quit. In other respects, all our observations were particularly satisfactory. These being completed on the evening of the 25th, the tents and observatory were embarked.

The night previous to our arrival, the steamer India, from Calcutta and Madras, with passengers for the overland mail, touched here for passengers and fuel, and departed on the evening we arrived off the port. She had on board several of our China companions, Captains Anson, Fletcher, Col. Adams, 18th regiment Royal Irish, and others whom I was anxious to meet. The Larne had landed them at Madras, and had not yet passed on, although they quitted Macao a week before us.

Point de Galle, or Galle, as it is simply termed by the residents, is situated on a peninsula, about half a mile in length by one-third of a mile in breadth, and is entirely comprised within the walls of the fortification; the parapets on the neck of the peninsula being about fifty to sixty feet in height. It was built by the Dutch; which may possibly account for the fact that none of the houses enjoy a view of the harbour, and consequently are not much benefited by the pure sea breeze. The greater part of the town, inhabited by the lower orders, is situated betwen the sea walls, and the houses occupied by government officers, which rise on the slope of the hill, on the land side. One exception, however, exists, in the house of the master attendant, Mr. Twynham, which is situated on the crown of a small

detached hill, commanding a free view from S. E. to N. W.

We experienced the most marked attention from this gentleman during our visit; and his anxiety to further our wishes in every point connected with our duties, calls for my warmest acknowledgment. Having been, during the whole of our visit, closely engaged in observatory duties, I was unable to see anything beyond the ramparts. My visits were confined to the major, the clergyman, and Mr. Twynham. A little recreation would have improved us all, but the general anxiety for home, and an impression that our sick would be better if exposed to the full sea breeze, forbade any detention beyond the moments absolutely required to complete our details.

The climate is delightful, and having experienced the sultry heat of Trincomalee, one can hardly believe that so few miles intervene, and that it is only six degrees north of the equator. It bears the character of being very healthy, is about a day's journey from Colombo, and two from Kandy.

Supplies of bullocks, poultry, and pigs, are easily obtained, and at a reasonable price. Water is supplied by the master attendant. Strangers cannot easily enter the port without a pilot; and then it is customary to station boats with flags on the most dangerous patches, which vary from three to twelve feet. Ships are usually moored with the bowers to seaward, and the stream in shore astern, which, by

keeping the ship's head to the swell, prevents great wear and tear, independent of comfort.

After experiencing much attention and kindness during our short visit, we quitted Galle on the morning of the 27th, with more regret than any place since quitting China. Our course was directed to reach the great Maldavia Atoll, but light airs prevented our advancing more than twenty-five miles by noon the day following. We were then in one hundred and seventy fathoms, and another attempt was made with the dredge, but she had drifted into one hundred fathoms before it reached bottom. The result of this experiment afforded us four live shells, of the genus chama. Sea at surface 82°, at the depth of one hundred fathoms 46° 5′.

We gradually edged off W. S. W., and the winds and currents driving us to the southward, forbade all hope of reaching King's Island: we therefore steered a course to pass through the "one and a half degree channel," which we entered about midnight on the 31st of January, and with a fresh breeze from N. E. expected to have been close in with the island, as laid down in our charts, before daylight; but in this we were disappointed; nor did we see land at all, having very probably been carried through the channel by the breeze and current before dawn.

Pleasant breezes and smooth water favoured us until the 7th of February, when in latitude 0° 40′ N. longitude 60° 50′ E., the wind veered to south, and we were again teazed by light airs, calms, and va-

riables. Up to this date we had experienced a strong current setting to the S.W., and varying from twenty-five to thirty miles in twenty-four hours. This current failed with the breeze.

Several tropic birds, noddies and boobies, were observed, and strong ripplings of currents. Soundings were tried for with two hundred fathoms, but without success. By the towing net we took a great variety of medusæ, mollusca, fine glassy crustacea, various hyalæa, nautilus, sepia, minute fish, particularly several varieties of balistes, and large *red* (unboiled) shrimps. These varieties we continued to obtain daily, particularly the glassy crustacea in *masses*, until crossing the equator in longitude 58° E., when several specimens of the live double-keeled nautilus were taken, and we were deserted by our old friends. It was remarkable that those which were likely to evade the net by night, as the nautilus and hyalæa, were taken at dawn or after sunset.

These were again succeeded by *solid* masses of transparent (probably) medusæ, but not exhibiting organization; gulf-weed, (fucus natans,) balistes, four-finned flying fish, and helix Ianthina.

To those inclined to pursue the study of medusæ, crustacea, &c., the tropics afford abundant field; but the pursuit requires perseverance, good apparatus, and a person to watch when the velocity is such as to injure the net, when it should be raised.

In this department of natural history, objects are seldom wanting in sea voyages, and such pursuits

tend considerably to lighten the tedium necessarily attendant on calms, adverse winds, &c.

We had reached within one hundred and eighty miles of the Séchelles Islands, one of which I had selected for my next position, but heavy squalls, rains, calms, and variables, sorely tried our patience.

On the 12th, being within one hundred miles of Séchelles, flying fish, circular radiated medusæ, and crustacea, were numerous, as well as fucus natans, and a peculiar flag-weed not before noticed. It is perhaps worthy of note, that in this region the fuci appear to be very healthy and in full fruit.

On the 18th, after beating two whole days to windward, we dropped our anchor at four P.M. in Port Victoria, Séchelles, close off the Isle St. Anne, on which I landed, and fixed on a position for our observatory, viz. the first small promontory north of the sandy bay, where several huts formerly stood, and immediately above the watering place, and turtle pond. In the morning we were visited by some of the authorities, in order to ascertain the condition of our crew, they being at this moment rather in dread of the small-pox.

As my pursuits would tie me to the observatory until the necessary observations for its confirmation were obtained, I despatched a letter to the civil commissioner, A. Mylius, Esq., promising to visit him on the morrow.

In the morning we took possession of the promontory, and before four o'clock Sulphur Village was

erected, with a fine grassy spot in front, and a clear and cool bubbling brook on our right, at which our boats commenced watering. We were also overhung with cocoa-nuts; but as these were private property, they were immediately placed under tabu. The island being the property of Mr. Savy, I had already sent to obtain his sanction to our holding possession during our stay. Fortunately also, there were but two blacks residing on the island, so that there was little fear of disturbance, or of our attention being distracted by purchases, &c.

Surrounded as we were by forests of cocoa-nuts, we had some difficulty in persuading Jack that he was not in the garden of Eden, where property was in common. Frequent ominous falls of ponderous bodies intimated that all my advice on the subject of "property" (or propriety) was of little avail, and I heartily wished the proprietor would make his appearance, in order that I might make some agreement with him as a matter of remuneration for the damage which I knew he must eventually sustain. As he did not appear to feel so much interest as myself upon the question of his own property, I was soon involved in other matters, leaving my veto to be enforced if possible. I regret, however, that two of our miscreants, not content with the robbery of the fruit, cut down one of the young Cocos de Mer,* a plant very difficult to rear, even in this group, which is their *only known habitat.*

* The absurd stories about this fruit are not worth insertion,

On the day following I visited Mahé, now Victoria, and called upon Mr. Mylius, by whom I was most warmly welcomed. On landing, I was not a little surprised to find our police (in uniform) had travelled thus far to meet us on our homeward route. Steam is no doubt doing wonders, but I naturally asked how came these coats here? However, the fine ebony countenance beneath the *black beavers* in a broiling hot day soon undeceived me; no Englishman has a head thick enough to stand that. The clothes are remarkably well-made, and the men carry themselves quite *à la militaire.*

The family of Mr. Mylius consists of his wife, a lady of Mauritius, three daughters and governess, besides *petites.* In a few minutes I was quite at home, and the disappointment that I was not to occupy the apartments prepared for me (as I was compelled to return before eight) was too genuine to be doubted. This, however, was but a visit of ceremony, and after an early dinner, I regained the island, a distance of about three miles.

On Tuesday they paid a visit to Sulphur Town and the ship, and on the day following, I managed to spare a day to examine Mahé, the officers joining us at dinner.

The port and town have lately changed their name from Mahé to that of Victoria; but I think in compliment to her Majesty that they should pre-

but it is of great interest as a botanical rarity existing only in the Séchelles.

viously have whitewashed or painted their houses, to afford some idea of a new face. They are falling very fast into decay. Between that formidable tropical enemy the white ant, and want of paint to protect them from the weather, they are as rusty as any of our country barns in the west of England.

The old French residents complain bitterly of the emancipation, and that their estates are fast falling into decay. Indeed, the blacks, lazy at all times, cannot be *persuaded* to work voluntarily, and I very strongly suspect that the change from slavery to freedom, or rather the entire destruction of any control over their persons, rendering it necessary to hold out allurements, or *adequate wages*, is nearer the real cause. They either have not the means of paying, or they cannot make their minds up to swallow the bitter pill of *paying* those to whose services they still maintain they are entitled.

I feel much interested about these people, and can see clearly that this heavy cloud, which never will be dispersed, must eventually blight all the prospects of the present holders of estates. The younger branches will never probably have the reality so clearly painted as to become a part of their constitutional antipathy, and will follow the example of the better informed, provided the march of intellect be not checked.

Capital they assert they have not; slaves they certainly have not: to hire them they have not the means; and unless some speculative characters drop

in with their spare thousands, it is very evident that this beautiful and very capable group will fall into insignificance. That this does not result from want of energy in their governor, as well as amongst themselves, there are abundant proofs, which were made fully apparent to me during my visit. They have formed various useful and scientific associations, and amongst other compliments, they forwarded immediately on my arrival an official ticket of admittance, accompanied by a complimentary letter from the Literary Society of the Séchelles, enclosing at the same time one of their almanacks. From the interesting matter contained in the latter, I have extracted the following description of

"DES ISLES LABOURDONNAIS DITES SECHELLES.

"These isles, twenty-nine in number, form the archipelago, which is the most considerable of the dependencies of the Mauritius, extending meridionally from 3° 40′ to 5° 35′ S., and longitudinally from 55° 15′ to 56° 0′ E., and situated about nine hundred and fifteen miles from the Mauritius. They were discovered and examined in 1742 by the Tartan, Elizabeth, Captain Lazare Picault, despatched by Monsieur Mahé de Labourdonnais from the Isle of France. The captain took possession in the name of the king of France, naming them the Labourdonnais Islands, and the principal or largest, Mahé, which name it still preserves. At a later

period the name of Séchelles was substituted for that of Sabourdonnais, in compliment to the Viscount Hérault de Séchelles."

[Note.—Yet the French inhabitants affect to be dissatisfied at the change of the name of the port to that of our beloved Queen, maintaining the honour for Mahé. Had they persisted in Picault, I could have comprehended their feelings; but as they readily dropped Labourdonnais, like good children, when they were bidden, I think even Mahé might die a similar death, without a well-founded groan.]

The names of the twenty-nine are comprehended as follows, an asterisk denoting those which deserve the names of islands, the remainder being mere rocks. 1 Mahé,* 2 St. Anne,* 3 Aux Cerfs,* (not inhabited,) 4 Anonyme, 5 South-East, 6 Longue, 7 Mayenne, 8 Ronde, 9 Therese, 10 La Conception, 11 Silhoutte,* 12 Du Nord,* 13 Praslin,* 14 La Digue,* 15 Curieuse, 16 Ronde, 17 Aride, 18 Feliceté,* 19, 20 Les Deux Sœurs, 21 Marianne,* 22 Recife,* 23 Les Mammelles, 24, 25 Cousin et Cousinne, 26 Frégate,* 27 Vaches Marines, 28 Denis, 29 Platte, 30 Bird Island, not mentioned; the northernmost in 3° 32′ S.

The island of Mahé, taken from Captain Owen's Survey, is sixteen miles N.N.W. and S.S.E., and about five miles in its widest point, and encloses all its islets in a sweep of forty-five miles. It is mountainous, with high jutting perpendicular cliffy peaks, intersected freely by ravines, and plentifully sup-

plied therefrom by water, resulting from perpetual condensation and showers. The soil is reddish, consisting principally of a decomposed granite, well adapted for vegetable productions, and, as before noticed, well-watered by the branches, natural as well as artificial, from the ravines.

On the eastern side of the island is the town situated at the mouth of a valley, formed by a chain of high mountains, bristling with rugged rocks, and surmounted by large trees. The most elevated point of this range is termed Morne Blanc, at the base of which several meandering streams traverse the town. The houses are built entirely of wood; they consist solely of a ground floor, and are generally surrounded by fruit trees within a palisade. Opposite and in front, within the semicircle formed by the isles St. Anne, Longue, Moyenne, Ronde, and L'Ile aux Cerfs, is the road of Mahé, now changed to Port Victoria, which might accommodate a large number of vessels; but I think I may safely (talking of vessels) reduce the number from three or four hundred to thirty or forty; and even that number cannot pick their berths.

Owing to the transparency of the water, all absolute dangers are visible, and the port or inner harbour may be safely resorted to, where vessels intending to remain any time, will find the water smoother, and without that swell which renders the outer anchorage (by reason of a heavy ground swell constantly turning in) very unpleasant. We also found

the anchorage near St. Anne's rocky, but the pipe-clay between the rocks holds well.

I would advise any vessel anchoring near that island, to run out the stream anchor astern in the direction of the swell, otherwise, upon any sudden flaw off shore during the night, she may be subjected to a sudden fit of rolling before it can be remedied; and kedges at that moment are liable to injure men as well as boats. The "stitch in time" should be borne in mind here. I know it to my cost.

Although situated so near the equator, these islands do not experience a high temperature; its range is very limited, and the only atmospheric changes which are remarked are the N.W. monsoons or gales, accompanied by lightning and heavy rains. The hurricanes of the Mauritius do not reach these limits.

The two monsoons, S. E. and N. W., observe nearly the same periods and character as those of Hindostan. The S.E. monsoon, or dry season, commences in April, and terminates in November. The N. W. monsoon, or rainy season, commences in November, and terminates in March. Sometimes, however, the breezes from the S.E. die away, and are succeeded by variables, accompanied by rain, but never of long duration.

The Sulphur experienced very strong south-easterly currents and winds from S.E., E.S.E., N.E., N., N.W., and S.W., within the last one hundred and eighty miles north-easterly from this group, and

calms and rain tediously frequent. This was during the early part of February.

The report on Séchelles informs us that "Few parts of the world are so favoured by nature as the Séchelles. Situated near the middle of the Indian Ocean, nearly equidistant from the neighbouring lands, they offer, besides a fine and secure roadsted, a climate equable and salubrious. Not liable to abrupt changes of atmosphere, they are exempt from those diseases so common to other tropical regions; nor are they visited by those scourges, the hurricanes, which elsewhere destroy all agricultural efforts, and are inevitably followed by misery and distress."

Some navigators are of opinion that these islands were known to the Arabs and seamen of the sixteenth century, but they certainly were not colonized until the year 1742. The first settlers who came to establish themselves amounted to seven, all of French origin. In the first instance they occupied themselves in taking turtle: but as the islands soon assumed more importance, Mons. St. Miel was appointed provisional governor for the king of France, succeeded by Messrs. Romanville, Berthelotte, Eilotte, Malavois, Caradec, Nageon, Enouf, and finally, M. Quéau de Quincy was appointed a military commandant and civil agent for the French Republic.

The population soon increased by the addition of several families from Bourbon and Mauritius, living very happily, and almost as one family, and much

attached to the latter governor, who reigned over them, as a father, for a period exceeding twenty years, and subsequently, as juge de paix under the British government, for eighteen.

The turn of war, however, brought its change for Séchelles. On the 16th May, 1794, Captain Newcome, commanding his Majesty's ship Orpheus, and having under his orders his Majesty's ship Centurion, Captain Osborne, and Resistance, Captain Pakenham, anchored in the roads, and demanded from the commandant the cession of the Séchelles group.

As the style, &c., of the transaction, appears to be original I have transcribed the document.

"By Henry Newcome, Esq., captain of his Britannic Majesty's ship Orpheus, and senior officer of his Britannic Majesty's ships employed on a particular service, &c., &c., &c.

"I do, in his Britannic Majesty's name, demand an instant surrender of the island of Mahé and its dependencies, with everything in and belonging thereto.

"I give you one hour from the delivery of this message to decide. If any resistance is made, you must abide by the consequence thereof.

"Given under my hand on board of his Majesty's ship Orpheus, this 16th day of May, 1794.

Signed, "HENRY NEWCOME."

The following capitulation was then offered and replied to.

CAPITULATION, MAY 17, 1794.

Jean Baptiste, Queau Quincy, captain au régiment de Pondicherry, No. 137, commandant militaire, et agent civil pour la republique Française aux iles Mahé ou Séchelles, Praslin, et autres adjacentes, propose la capitulation suivante au Commodore Newcome, commandant l'Orpheus, pour sa majeste Britannique, la division et l'expédition partieulière, compose du Centurion, Captain Osborne, et de la Resistance, Captain Pakenham, d'après sa sommation en date du 16 Mai, 1794.

Henry Newcome, captain of his Majesty's ship, Orpheus, and senior officer of his Majesty's ships and vessels, employed on a particular service, &c., &c., &c.

ART. 1. La colonie, place, et la batterie de l'ile Mahé, ou Séchelles, Praslin, et toutes les dépendances, se rendront au Commodore Newcome, le 17 Mai presente année, a neuf heures de matin. La garnison Anglaise s'emparera des postes, batteries, bâtimens civils, et le pavillon Anglaise sera lissé sur la place.

ART. 1. I shall take possession of the colony of Mahé and its dependencies.

ART. 2. La batterie de la place tirera trois pièces a boulet; il sera fait trois décharges de mouskettrie avant d'amener le pavillon Français.

ART. 2. Agreed.

ART. 3. Les propriétes des habitans seront tres respectées, il ne leur sera causé aucun trouble, ni dommage dans leurs biens, meubles, immeubles, vaisseaux, marchandises, esclaves, et dans leur personne en aucune manière.

ART. 3. Private property shall be respected. The inhabitants and their slaves shall remain unmolested.

I take the brig Olivette.

ART. 4. Les batteries, munitions, canons, magasins, toutes les bâtimens civils et effets appartenant à la republique, ne seront pas toucheés : le tout restera dans l'etat actuel.

ART. 4. The cannons, military stores, and effects belonging to the republic in their magazines shall be at my disposal.

The public buildings shall be preserved. The two small pieces, carrying two pounds balls, shall be permitted to remain on the parade facing the government-house, for the purpose of making signals, in case of insurrection amongst the slaves.

ART. 5. Le commandant militaire, et agent civil, ne sera point fait prisonnier de guerre.

ART. 5. He shall be prisoner of war only during my stay.

ART. 6. Les régistres et papiers, utiles aux citoyens habitans, et ceux de la republique pour la comptabilité seront respectées et non visités ; etant interessant pour les familles et pour l'etat que les choses aussi necessaires soient conservées.

ART. 6. Agreed.

ART. 7. La dite capitulation faite de bonne foi sera garanteé par la signature du Commodore

ART. 7. Agreed.

Newcombe, et signée par le commandant militaire et agent civil, et par trois citoyens habitans des Séchelles representant le corps de citoyens des iles Mahé, ou Séchelles et Praslin.

Fait à Mahê iles Séchelles le 17 Mai, 1794.

(Signé) J. B. Queau Quincy.

Done on board his Britannic Majesty's ship, Orpheus, in the roads of Mahé or Séchelles, the 17th day of May, 1794.

Signed, Henry Newcome.

Nevertheless, it was not without apprehension that the inhabitants returned to their pursuits; but the capture of Bourbon and Mauritius re-established their confidence; and the definitive peace of 1814, where these islands became a dependency on Mauritius, entirely revived commercial relations.

France certainly lost here a very important position. But it was equally important to Great Britain, that Mauritius should not have so formidable a position in the hands of strangers,—commanding the commerce of these seas, from Africa, and throughout the Red Sea, up to Ceylon; the very key of our western trade. But it is still unfortified, and nearly as bare of defence as in 1742.

Upon the cessation of the Mauritius, the government of these isles devolved upon an agent or commissioner, under the government of Mauritius. At this period the free population numbered five hundred and sixty-six persons, and the census gave the

blacks at six thousand six hundred and thirty-eight souls. This figure is at present considerably diminished.

Since Great Britain has assumed the government of the isles, the following persons appear to have held the appointments of commandant and civil agents; Sullivan, Quincy, Lesage, Madge, Harrison, (1826) Wilson, (1837,) C. A. Mylius, Esq., civil commissioner and present resident, (1838.)

Of the productions of the Séchelles, I can only refer to those which, during our short visit, came under my observation, and of which I obtained some few samples, through the kindness of my friend Mr. Mylius.

Cotton, coffee, cocoa, cloves, cinnamon, nutmeg, anatto, maize, and fruits and vegetables of every species found within the tropics. It is indeed a garden, in which anything would thrive. Any species of habit, soil, or climate may be selected, from the close damp heat of the forcing-house, to the open exposed sun and air, moist or dry.

The timber is much esteemed for ship building; and I am given to understand that the Hibiscus tiliaceus, or purau of the Polynesian Islands, so useful in boat building, could be obtained here in any quantity. The hard wood used for ships' timbers very much resembles the Tamanu, (Calophyllum inophyllum) of the Pacific, or mahogany; but is more easily worked; in fact, better adapted for ship building.

The finer woods for cabinet purposes are also abundant, and many pieces of furniture, particularly that made of the *bois de nat*, are very beautiful.

It appears that since 1810, with their reduced force of artificers, they have launched no less than forty-five vessels, ranging from thirty to four hundred tons, and amounting altogether to four thousand five hundred and two tons. Several are at present on the stocks, one of one hundred tons, and one of four hundred and twenty tons.

We found a French national schooner (a tender) from Bourbon, hauled up to rebuild; her crew occupying a small islet.

The islands abound with cocoa-nuts, fruit, vegetables, fish, turtle, and bullocks, and they offer every inducement for refit and recruit (secure from hurricanes) to our cruizers in these seas. Such visits, indeed, are for many strong reasons of the utmost importance, and more particularly to the authorities.

In point of medical aid also, it would be of the highest benefit, as notwithstanding the boasted salubrity of the climate, there are many casualties and common diseases which frequently defy ordinary treatment in those not *professing* skill; and at the period of our visit no such persons acted at Victoria or on the island of Mahé; consequently our surgeon was a most welcome and important visitant.

With but slight expense, a very convenient depôt for stores, and jetty for heaving down, might be constructed, the reefs within the port affording

every facility, rising suddenly within a foot of the sea level, and having a depth of three or four fathoms at the distance of thirty feet, which would be about the position for the keel of a line-of-battle ship.

In consequence of the complete stagnation of business, we found money scarce, and bills not negotiable; we even experienced difficulty in arranging for the few supplies obtained.

The principal objects of our visit having been completed, viz. the measurement of the meridian distance and magnetic details, we took leave of our kind friends, Mr. Mylius and family, to whom we are indebted for much kindness, civility, and enjoyment, and on the evening of the 24th February quitted our anchorage.

Favoured by a heavy squall of thunder, lightning, and rain, we rounded the southern end of Mahé about midnight. It is not frequent that seamen hail such meteorological visitors with satisfaction, but tantalised so long as we have been, on this our homeward voyage, by such a series of calms and variables, we were grateful for any incident which would speed us to the Cape, where, doubtless, want of wind will be our last complaint.

Having cleared this group, we endeavoured to close or pass to the northward of the Amirantes, or even to the westward of any of the islands situated in our route to Madagascar; but our old bad fortune pursued us, the currents driving us rapidly to

the S.E. The weather, also, prevented our obtaining the necessary observations for navigating with the requisite precision through these dangers.

I often fancy there is something about a surveying ship, which helps her through difficulties in the most extraordinary manner, and especially so in the case of the Sulphur. Surveyors are, indeed, in plain terms, pilots, and as such endued with a species of intuitive impression of where they are, in spite of all obstacles. This was most fully exemplified on the morning of the 2nd of March, when, by the reckoning we were well to the westward of Providence Island. I *felt* otherwise, and doubled the precautions. At dawn we found the reefs under our bows, and only fifteen fathoms of water beneath us. One hour later daylight might not have given sufficient notice. However, the ship was soon leaving it as rapidly as she had approached, and edging along the reef, varying our soundings from five to twenty fathoms, and steering from S.S.W. to E.S.E. for twenty miles, cleared its southern extremity about noon.

Unfortunately, the absence of sun and horizon, and the prevalence of heavy rain, prevented our making any satisfactory examination of this danger. The bank of soundings appears to trend S.S.E. from Providence Island, as in most instances we had to haul out E.S.E., to keep in ten or fifteen fathoms, and always shoaled when changing our course to South. The bottom appears tolerably even, and it was

plainly visible, composed of sand, studded with small rocky patches. There was but little surf. At the moment we rounded the southern tail, the main island bore N. ½ W.

Before dark we made Farquhar's, and the Six Islands broad on our lee-beam, and we now had hopes of weathering the north end of Madagascar, a point until this moment (and even then) very problematical in my mind.

On the 5th of March, we rounded Cape Sebastian, but still experienced a strong current against us. On the 9th, despairing of reaching Bembatooka, in reasonable time to make good our meridian distance, we bore up at noon, and ran into Majambo Bay, west coast of Madagascar, where we anchored about four P. M., off a low sandy point well adapted for our observatory. I should have selected the northern point, as that given in Captain Owen's chart; but the anchorage being unsafe, and landing dangerous, I contented myself with a position two miles further to the southward.

The tents, &c., were erected before dark, and having my fowling-piece with me, I succeeded in killing a few partridges of a species entirely new to us.

Fortunately we succeeded in obtaining our suite of observations the day following, which was a great consolation after our late incessant rains.

Not a sign appeared of any recent huts, villages, or inhabitants; and the whole coast, although grate-

ful to the eye, was barren of amusement, save to the sportsman, and probably the botanist. The former found full employment.

The tree palm, of several varieties, acacias, tamarinds, a plum with four seeds, in great abundance, and many unknown fruits, abounded. Many bulbous roots occurred in the sand immediately about us, and during a short ramble, I collected several objects which may prove interesting.

Amongst the reptiles, we obtained iguanas, lizards, chameleons of three varieties, with centipedes, cockroaches, and two large snakes (apparently water.)

The birds comprised partridges, quail, waders, ducks, guinea fowl (very large and heavy,) curlew, hawks, kingfishers, parroquets, and several minute birds of gaudy plumage.

The soil on our immediate location, and which appeared to constitute even the high hills behind us, was entirely fine quartz sand, a perfect waste for acres in spots. A very remarkable formation was noticed outside from the ship, when entering, and situated about three miles west of the north point. It doubtless was this same sand, which giving way to the heavy rains, left a valley of grotesque lamellar pyramids, resembling the ruins of a city, and having on the two sides broad streams of sand flowing to the sea.

Where the rocks protruded, they were found to be a close aggregation of shells, and from their position probably of ancient date.

About seven or eight miles to the southward, on

the same side of the bay, I visited the cliff, to ascertain the nature of the rock, which I found to be superstratum coarse red sandstone; No. 2, indurated clay; No. 3, apparently the same in a more indurated state; substratum softer, apparently pipe-clay. Large black blocks and boulders were noticed on the summits, which (from some which had apparently been cast on the beach,) I presume to be the coarse sandstone conglomerate. The water flowed over the cliffs and down the ravines in profusion.

We obtained mullet of several varieties, and very large. Porgy and other tropical fish were abundant; several unknown. These were taken by a net set across a creek at high water; but they were all spoiled, from want of proper salt for the curing mixture. Large sharks were abundant, and pieces of turtle; but none of the latter noticed alive, nor their tracks on the extensive sandy beaches.

Latterly one or two natives were seen near the northern point, but none would communicate.

Having completed our labours on the 15th March, we embarked, and put to sea that night. For several previous evenings, we had been visited by heavy squalls, attended with rain, thunder, and lightning, and this night we experienced rather an unpleasant attack, which laid our lee cabins under water, and did much damage in our department.

Our crew still continued to suffer from their

diseases contracted in China, and on the eighth G. Spry, a promising lad, fell another victim.

The same worrying weather continued to attend us, and on the 19th we had only advanced ninety miles from our Port of Departure. We fell in with an American schooner, trading between Zanzibar and Bembatooka, but gained no intelligence from her. Indeed, our track has laid so completely out of the commercial line, that the sight of a strange sail is quite an event.

We now shaped our course to reach the nearest point of the African coast, hoping to meet with the strong southerly currents *said to prevail* in the Mozambique.

On the 31st of March we had only reached latitude 22° 11′ S., longitude 36° 31′ E., but a very heavy long-jawed swell from the S.E. plainly indicated that heavy breezes had prevailed in that direction.

Many objects of interest offered, more indeed than the calls on my time could allow me to attend to as closely as they merited. By the towing net, living nautilus, several varieties of hyalæa, cleodora, minute univalves, glossy nautilus, and crustacea in great variety, abundance, and beauty: enough to afford ample enjoyment to the naturalist, and as many draughtsmen as he could find. But in this latter point the Sulphur was at a very low ebb.

Pressed still to the northward, current bottles were thrown overboard at eligible points. Temperature at

79° 5′, atmosphere moist, and sick list rather on the increase; and to add to these inconveniences, and render our crew less contented, provisions barely sufficient to reach the Cape by reducing one third, until we reach the range of steady or strong breezes.

It had been my intention to have made one more station at Delagoa Bay, but under these circumstances, and without a chance of obtaining bread or flour there, I was forced to give up all idea of delay, or risk of being caught in that bight by strong south-east breezes.

On the 2nd April we reached in to Point Barrow, where we experienced a fresh working breeze, and by working close in shore, rounded Cape Corrientes before dark. At this point we first experienced the influence of the southerly current, and from this date made great progress, but the favourable breezes never continued longer than thirty-six hours, and were generally succeeded by one exactly adverse.

On the 10th we struck soundings on the east shoulder of Lagullas bank, in seventy fathoms, and at eight A. M. were about thirty miles S. W. of Cape Reciffe. Although we ran off shore thirteen miles, our soundings varied only from sixty-five to seventy fathoms.

Here, baffling winds detaining us, fishing lines and dredges were in action. Two very acceptable fish of the Porgy tribe were hooked, and nine univalves, five bivalves, three euryale, and several echini, were obtained by the dredge from sixty-five fathoms;

sea at surface 64°, bottom 62°, and evidently fossil. Not more than a degree difference of temperature was noticed at first entering soundings. But as this was more minutely watched, as we purposely edged in and off the bank, it was found off the southern edge to change from 64° to 67°. In the Pacific this had been narrowly watched, but the law was found to be inapplicable, even off the mouth of the river Columbia, Sitka, and high northern latitudes.

On the 12th of April, being becalmed in fog, about one hundred and eight miles off Cape Hanklip, the dredge was dropped in seventy fathoms, by which many very interesting specimens were procured, particularly of Terebratula, which occurred alive and in great variety.

On the 13th, at noon, we were twenty-two miles off Cape Hanklip, and the breeze favouring us, expected momentarily to see it break out from the surrounding haze. About three P.M., we passed it within three miles, and at four, sighted the Southampton, bearing the flag of Vice-admiral Sir E. King.

Strong haze and fog, with sun directly in our faces, did not admit our making out anything before we were abreast Roman Rocks, having overrun our distance much, and before our number could be made we were rather close upon the flag-ship. Having but one pair of signal halliards the number and the pendant could not enjoy the mast head together, and when the former came down the ensign went

up. Some other trifling accidents prevented our taking up our intended berth, and probably not shifting our ensign in time; for all of which I was made to feel very keenly on paying my respects.

On board the Southampton I had the good fortune to meet my old friend Captain Ogle, with whom I had become acquainted at Callao, when commander of the President, in 1838. We had not the good fortune to receive a single letter for any individual on board the Sulphur.

As the refit of the ship could be conducted by the first lieutenant, the moment I was released by the admiral, I obtained leave to repair to the Royal Observatory, Cape Town, in order to compare our magnetic instruments with those at the Magnetic Observatory conducted by Lieutenant Wilmot, R.N., thus affording decided values to the series observed at the station between this and Singapore.

I experienced a very warm reception from Lieutenant Wilmot. Mr. Maclear, the astronomer royal, was absent on the triangulation connected with the measurement of the meridian, but from his able factotum, Mr. Mann, I received much kind assistance, and every facility which the observatory afforded. The result of my observations proved that I had no reason to doubt the steadiness of the dip or declination instruments, as they agreed sufficiently close with the observations of the days. The intensity will be proved hereafter. Of these I had less doubt, from their general uniformity during our

stay in China, as well as between our periods of observation (one year) at Singapore.

During my visit to Cape Town I had the pleasure of renewing my acquaintance with Commodore Wilkes, (lieutenant, United States navy,) commanding the United States Exploring Expedition, and who had behaved so handsomely to us when we unshipped our rudder at the Feejees, giving us the rudder pintles of the Peacock. We had many affairs to talk over, and many notes to compare, as he had visited the greater number of our stations, and unfortunately lost one of his consorts, the Peacock, on the north bar of the river Columbia, where she became a total wreck, the crew barely escaping with their lives.

On my return to Simon's Bay, our needles were again tested at the position occupied by Captains James Clarke Ross, and Crozier, and the ship being ready for sea, we most joyfully quitted Simon's Bay for St. Helena. Fortunately, the breeze favoured us, and by midnight we passed within musket-shot of the Bellows Rock, and were once more in the Atlantic. A heavy sea on our beam caused us to roll and strain much for several days, but this soon wore off, and we contrived to drop our anchor on the 14th day at St. Helena.

Here I found her Majesty's ship Grecian, commanded by my old shipmate, Captain Smyth, (in three vessels since 1814,) whom I very soon had the pleasure of shaking by the hand; and having made

the necessary arrangements for pitching my tent where Captain Ross observed, galloped off to Plantation House, to pay my respects to the governor, Colonel Trelawney, R.A., who received us without formality, introduced us to his family, and mounting his horse, accompanied us to Longwood, to call on Lieutenant Smyth, in charge of the magnetic observatory.

We were rather late, and met Mr. Smyth at the gate. Turning our horses, he walked a considerable distance in conversation with us; just long enough to make us regret that we were to part so soon. Enveloped in darkness, and roads rather doubtful, we did not return quite so expeditiously, reaching Plantation House about eight o'clock, and sat down to dinner, much, I fear, to the discomfiture of family arrangements.

Duty compelling our return that evening, we remounted our horses soon after dinner, very much against our own inclinations, and not without many expressions of chagrin on the part of our kind host; and about midnight reached James' Town, where, by the hospitality of our good friend, Mr. Solomon, or rather the friend of the navy, we were comfortably housed.

Our visit was repeated the day following, and on Monday, the governor, accompanied by his second daughter, chief-justice, (Wild,) and one or two friends, paid a visit to the Sulphur and Grecian, very much to our gratification.

Our duties complete, we quitted shortly after daylight, I must say with great regret. Possibly had the Grecian remained, I might have stolen another day or two to make it a rating position, and shortened my stay at Ascension. Our visits of sunshine have been "few and far between" during the harassing period of our servitude, and when we meet with kindness, with such true honest English feeling in particular as that experienced at St. Helena, although "*homeward bound*," we did regret that our friendship was to terminate so suddenly. Captain Smyth breakfasted with me off the port, and our long explanations and tales of other times, rapidly recapitulated, and but half exhausted, (and who but sailors can participate in such revellings?) we parted with a hearty cordial grasp, to finish our stories at a future day.

Shortly the beautiful, well-handled Grecian stole close on our lee-quarter, and hauling suddenly to the wind across our stern, slipped off with a last farewell, like a sea bird, whilst the Sulphur was bruising the blue sea in a most collier-like style.

Our course was now directed for Ascension, and with a fine fresh trade we reached the anchorage about two A.M. on the fourth day. We found here the Albert, one of the unfortunate Niger expedition, commanded by Commander Fishbourne, awaiting further orders.

He called on me the following morning, and afforded us all the late English news. Our operations

were speedily completed at this island, and having embarked all the invalids anxiously awaiting passage, we took leave of the Albert on the evening of the 18th of May.

Ascension affords but little to interest the casual observer. It has long been famed for the abundance of turtle, of which we did not fail to embark our due allowance: but with the exception of water, it rather looks for than affords supplies.

Our progress from hence was tediously slow. I had intended to reach Porto Praya in the Cape de Verds, but the great delay which occurred between the limits allotted to the variables induced me to give up this plan, and stretch towards the coast of Africa, where I hoped to catch, as I had experienced on former occasions, a leading wind which would carry me up to the Azores.

During our detention near the equator, we were fortunate in obtaining very large and perfect specimens of the helix janthina, as well as several rare and beautiful varieties of nautilus, hyalæa, and cleodora.

About the beginning of June, in latitude 5° 30′ N., and longitude 16° 15′ W., we began to experience the tail of the tornadoes, and on the 3rd were visited by one in full force. At night the sea presented a very luminous appearance, and on the day following several varieties of medusa, some resembling large sepia, were obtained.

On the 17th of June, we reached Cape Blanco,

but, unlike the customary weather of the region, found ourselves tantalised by a misty calm. This, however, did not long continue. We succeeded in reaching off shore, and gaining the breeze, and on the 3rd of July passed the island of St. Michael's, Azores. On the 19th, passing through the Needles, we ran up and anchored at Spithead, when, having paid my respects to the admiral, Sir E. Codrington, I repaired to the Admiralty. The Sulphur was ordered to Woolwich, and paid off on the 2nd of August.

The Lords of the Admiralty, in consideration of the long servitude of the crew of the Sulphur in such trying climates, during a period of nearly seven years, directed that those who had exceeded five years should be paid the increased wages due by recent regulation, and that half of the amount of slops during the Sulphur's voyage should be remitted.

As circumstances have rendered the Marquesas of greater interest since the period at which I treated that subject, and I have had access to other materials since my return, I have added a fresh outline, which will be found in the Appendix to this volume.

The urgent duties which have occupied my time since my return to England, and my immediate departure in command of a voyage of equal interest, necessarily prevents the completion of many interesting documents, which should have been attached to these volumes. The completion of these subjects will,

however, appear in the Transactions of some of our Societies.

The department of natural history has been distributed amongst its various competent and distinguished labourers, under the superintendence of Mr. Hinds, and I trust will shortly follow these my humble records.

APPENDIX.

APPENDIX.

No. I.

NICARAGUA.

The following has been extracted from a report made by our vice-consul, Mr. Foster, in 1837.

The import trade of this state (Nicaragua) and the country in general, has not suffered so much as might have been expected from the very severe visitation of cholera during this year.

The prices of foreign manufactures have now found their level in these markets, and the consumption of those articles used by the poorer classes have increased in a wonderful degree both in quantity and quality, and this demand for foreign manufactures (of which "British cottons" of inferior quality bear a prominent part) will naturally go on at an increased ratio.

The foreign imports may be classed under the following heads.

British; consist of calicoes, printed cottons, domestic or grey and power-loom shirtings, linen, and cotton-

mixed, or unions; linens, muslins, hosiery; hard earthenware, iron, steel, lead, powder, &c.

French; consist of silks, printed cottons, cambrics, wine, spirits, jewellery, and fancy articles.

United States; consist of domestic cottons, soap, sperm candles, hardware, spirits of inferior quality, powder, &c.

Spanish; paper, silk, ribbon, wine, oil, spirits, &c.

Germany: osnaburgs, glassware, wax, furniture, hardware, steel, wine, &c.

Italy; paper, oil, silk, liqueurs.

Colombia; cocoa, and straw hats.

Peru; jerga, (a coarse woollen cloth,) tin, spirits, and common sweet wine.

Chili; of sweet wine, pellones, &c.

The value of British goods imported may be taken at two-thirds of the whole of the imports.

The consumption of French goods, being principally articles of luxury, are chiefly confined to the cities of Guatemala, San Salvador, Granada, &c. German linens, shirtings, and glassware are articles of general consumption. In Spanish goods, with the exception of ribbons, the imports are trivial; they have given way to those of France and Italy.

The sickness of this year has had considerable influence on the exports. Cochineal and indigo form the principal; great quantities, particularly of the former, are shipped from the ports on the northern side of Honduras. From the ports of the Pacific fifteen hundred serons have been exported during the year to Europe, and the ports of Peru and Chili. (In the interior of both these countries a great quantity of indigo is con-

sumed.) Hides, horns, sarsaparilla, and balsam, for Europe and the United States, and mahogany, cedar, and sugar, for Chili and Peru. These form the principal articles of export trade; which, in proportion to the imports, is on the increase. Brazil wood, with which this state as well as Costa Rica abounds, formerly afforded employment to a great number of British vessels. The fall of this article in the home markets has for the present caused it to be but little sought after.

In agriculture this state is rapidly improving; in addition to indigo, sugar, cocoa, wheat, rice, &c., coffee and cotton are now better attended to, but more particularly cotton and indigo. The quality of the former, which is much esteemed and known in the European markets as "green seeded," is an annual plant; the staple is short, which is overbalanced by its superior fine texture, and it is peculiarly adapted to certain manufactures.

New arrangements in the tariff are about to take place, but the present state of revolution must suspend any remark upon this question.

The province of Nicaragua has the advantage of diversity of climate, the plains in the vicinity of the large towns of Leon, Granada, and Nicaragua, being tropical, and the heights nearing the lakes from the Pacific, as Chocoyos, Matagalpa, and Segovia, being temperate, whilst in the region about Honduras it is generally cold, even for an European.

The soil is everywhere fertile, and capable of yielding every species of produce of corresponding temperature. Mines also exist, but are not worked for want of capital and population; particularly as the plains afford abund-

ance of nutriment to the limited population, at very trifling labour.

The seasons are periodical, with trifling variation. The summer, or dry season, commences the early part of November, and the winter, or wet season, in the latter end of April, or beginning of May.

The summer is perfectly dry, at which time commercial intercourse is carried on, which, during the winter, particularly the latter end, becomes difficult, on account of the impassability of the roads.

It is during the winter that the agriculturist commences his labours, and during the months of September and October that the rains are excessive.

The climate is considered generally very healthy, although intermittent fever, by neglect, degenerates into typhus: there are no epidemical diseases peculiar to it. The health of the natives, as well as that of Europeans, is influenced at the change of the seasons. Any important deviation may be traced to neglect or excess; particularly as regards foreigners.

The temperature in the shade ranges from seventy to ninety in the plains near the sea coast.

The internal commerce of the country is facilitated by good cart roads in the plains, which are practicable (even in their neglected state) from the South Pacific to the town of Granada on the Lake of Nicaragua.

Should rail-roads or steamers be brought into action, the communication with the Atlantic will lead commerce direct into the heart of the State. But of this no estimate can be formed. The government are using every effort to connect these lakes of Nicaragua and Managua with

either ocean; but I think the day of achievement is yet distant. What is to repay the speculators when good navigable access does not succeed? A *superfluity* only can warrant the undertaking. As to any canal into the Pacific, unless behind Momotombo Telica and Viego range, into the Estero Real, I see little feasibility in the scheme.

The population of Nicaragua does not much exceed one hundred and sixty thousand souls. The inhabitants in general are honest and industrious; of the authorities we will say but little.

Cardon, at the mouth of the port of Realejo, is situated in 12°, 28′ N., and about 87° 12′ W. It has two entrances, both of which are safe, under proper precaution, and in all weathers. The depths vary from two to seven fathoms, and good and safe anchorage extends for several miles; the rise and fall of tide is eleven feet, full and change 3h. 6m. Docks or slips therefore may easily be constructed, and timber is readily to be procured of any dimensions. Wood, water, and immediate necessaries and luxuries are plentiful and cheap. The village of Realejo is about nine miles from the sea. Its population is about one thousand souls; the principal occupation of the working males is on the water, loading and unloading vessels. It has a custom-house, and officers under a collector, comptroller, and collector and captain of the port; of him or his guards we will not say too much. The sooner they find one less troublesome the better.

One branch of the river, the Donna Paula, takes a course towards Leon, and is navigable to within three leagues of that city. It has been suggested to carry a

rail-road from Leon to the lake of Managua. This might be effected ; but neither the people, government, or consideration of the returns, will at present warrant any such step, unless as the sole act of the government.

No. II.

Convention between His Majesty, and the Emperor of Russia, respecting the free navigation, commerce, and fisheries in the Pacific Ocean, and the limits on the N. W. coast of America. Signed at St. Petersburgh, February 28th, 1825. Presented to both houses of Parliament by His Majesty's command, May 1825.

His Majesty the king of the United Kingdom of Great Britain and Ireland, and His Majesty the Emperor of all the Russias, being desirous of drawing still closer the ties of good understanding and friendship which unite them, by means of an agreement which may settle, upon the basis of reciprocal convenience, different points connected with the commerce, navigation, and fisheries of their subjects on the Pacific Ocean, as well as the limits of their respective possessions on the N. W. coast of America, have named plenipotentiaries to conclude a convention for this purpose; that is to say,

His Majesty the King of the United Kingdom of Great Britain and Ireland, the Right Honourable Stratford Canning, a member of his said Majesty's Most Honourable Privy Council, &c.; and His Majesty the Emperor of all the Russias, the Sieur Charles Robert, Count de Nesselrode, his Imperial Majesty's Privy Councillor, a member of the Council of the Empire, Secretary of State for the department of Foreign Affairs, &c., and the Sieur Pierre de Politica, his Imperial Majesty's Councillor of State, &c.; who, after having communicated to each other their respective full powers, and found these in good and due form, have agreed upon and signed the following articles.

Art. I.—It is agreed that the respective subjects of the high contracting parties shall not be troubled or molested in any part of the ocean commonly called the Pacific Ocean, either in navigating the same, in fishing therein, or in landing at such parts of the coast as shall not have been already occupied, in order to trade with the natives, under the restrictions and conditions specified in the following articles.

Art. II.—In order to prevent the right of navigating and fishing exercised upon the ocean by subjects of the high contracting parties from becoming the pretext for an illicit commerce, it is agreed that the subjects of his Britannic Majesty shall not land at any place where there may be a Russian establishment without the permission of the governor or commandant; and on the other hand, that Russian subjects shall not land, without permission, at any British establishment on the N. W. coast.

Art. III.—The line of demarcation between the pos-

sessions of the high contracting parties upon the coast of the continent, and the islands of America, to the north west, shall be drawn in the manner following.

Commencing from the southernmost point of the island, called Prince of Wales Island, (which lies in the parallel of 54 degrees, 40 minutes, north latitude, and between the 131st and the 133rd degree of west longitude, meridian of Greenwich,) the said line shall ascend to the north along the channel called Portland Canal, as far as the point of the continent where it strikes the 58th degree of north latitude. From this last-mentioned point the line of demarcation shall follow the summit of the mountains situated parallel to the coast, as far as the point of intersection of 141st degree of west longitude, (of the same meridian,) and finally, from the same point of intersection, the said meridian line of the 141st degree, in its prolongation as far as the Frozen Ocean, shall form the limit between the Russian and British possessions on the continent of America to the north-west.

Art. IV.—With reference to the line of demarcation laid down in the preceding article it is understood:

1st. That the island called Prince of Wales Island shall belong wholly to Russia.

2nd. That whenever the summit of the mountains which extend in a direction parallel to the coast, from the 56th degree of north latitude to the point of intersection of the 141st degree of west longitude, shall prove to be at the distance of more than ten marine leagues from the ocean, the limit between the British possessions and the line of coast which is to belong to Russia, as above mentioned, shall be

formed by a line parallel to the windings of the coast, and which shall never exceed the distance of ten marine leagues therefrom.

Art. V.—It is moreover agreed that no establishment shall be formed by either of the two parties within the limits assigned by the two preceding articles to the possessions of the other; consequently British subjects shall not form any establishment either upon the coast or upon the border of the continent comprised within the limits of the Russian possessions, or designated in the two preceding articles; and in like manner no establishment shall be formed by Russian subjects beyond the said limits.

Art. VI.—It is understood that the subjects of his Britannic Majesty, from whatever quarter they may arrive, either from the ocean or from the interior of the continent, shall for ever enjoy the right of navigating freely and without any hindrance whatever, all the rivers and streams which, in their course to the Pacific Ocean, may cross the line of demarcation upon the line of coast described in article three of the present convention.

Art. VII.—It is also understood that for the space of ten years from the signature of the present convention, the vessels of the two powers, or those belonging to their respective subjects, shall mutually be at liberty to frequent, without any hindrance whatever, all the inland seas, the gulphs, havens, and creeks on the coast, mentioned in article three, for the purposes of fishing and of trading with the natives.

Art. VIII.—The post of Sitka or Novo Archangelsk, shall be open to the commerce and vessels of British subjects for the space of ten years from the date of the

exchange of the ratifications of the present convention. In the event of an extension of the term of ten years being granted to any other power, the like extension shall be granted also to Great Britain.

Art. IX.—The above-mentioned liberty of commerce shall not apply to the trade in spirituous liquors, in fire-arms, or other arms, gunpowder, or other warlike stores; the high contracting parties reciprocally engaging not to permit the above-mentioned articles to be sold or delivered in any manner whatever to the natives of the country.

Art. X.—Every British or Russian vessel navigating the Pacific Ocean, which may be compelled, by storms or by accident, to take shelter in the ports of the respective parties, shall be at liberty to refit therein, to provide itself with all necessary stores, and to put to sea again without paying any other than port and lighthouse dues, which shall be the same as those paid by national vessels. In case, however, the master of such vessel should be under the necessity of disposing of a part of his merchandise, in order to defray his expenses, he shall conform himself to the regulations and tariffs of the place where he may have landed.

Art. XI.—In every case of complaint on account of an infraction of the articles of the present convention, the civil and military authorities of the high contracting parties, without previously acting or taking any forcible measures, shall make an exact and circumstantial report of the matter to their respective courts, who engage to settle the same in a friendly manner, according to the principles of justice.

Art. XII.—The present convention shall be ratified, and the ratifications shall be exchanged at London, within the space of six weeks or sooner, if possible.

In witness whereof, the respective plenipotentiaries have signed the same, and have affixed thereto the seals of their arms.

Done at St. Petersburgh the 28th day of February, in the year of our Lord one thousand eight hundred and twenty-five.

(Signed) Stratford Canning.
The Count de Nesselrode.
Pierre de Politica. (L.S.)

No. III.

MARQUESAS.

This group of islands, generally known to navigators of the present day as the "Marquesas," was discovered at two different periods.

In the year 1595, the expedition under the command of Alonza Mendaña de Neyva first discovered Santa Christina, or Tahuata; La Dominica, or Hioaoa; San Pedro, or Mohotani; Santa Madalena, or Fatuiva. These received the name of the Marquesas de Mendoza.

They were subsequently visited, and described by Cook,

and the Forsters, in 1774, when Hood's Island was added to the group.

In 1791, an American captain (Ingraham) discovered the islands of Nuhuhiva (or Nuuhiva, abbrev.), Uahuga, or Washington Island, and Uapou, or Adam's Island. This second discovery of part of the same group received the name of the Washington Islands.

In June of the same year, Marchand, a Frenchman, also claimed the discovery of the latter portion, but the palm has been generally awarded to Ingraham.

Lieut. Hergest, in command of the Dædalus, part of the expedition under Captain Vancouver, visited them in 1792, and fancying them undiscovered, named them as follows—Nuhuhiva, Sir Henry Martin's Island; Uahuga, Riou's Island; and Uapou, Trevenon's Island. He also added Hergest's Rocks, and the northernmost, or Robert's Island, at that period uninhabited.

These names have been indiscriminately in use amongst subsequent navigators, but the whole group is generally recognised as the Mendaña Archipelago, or "The Marquesas."

There is every reason to believe that the whole group was known to the earlier Paumotu navigators; as Tupia, the native of Ulietea, who embarked with Cook, intending to visit England, furnished the data from memory, for many of the later discoveries, and in his north-east group, evidently intended for the Marquesas, distinctly afforded the *names* of ten, three of which agree with the subsequent discoveries. It is probable that upon a closer examination all could be traced, as Vaitahu is merely the name of one of the *bays* of Tahuata (Santa Christina.)

From the data thus furnished, a chart was constructed by Sir J. Banks, during Cook's first voyage, and it was not until the year 1774, in his second, that he knew any other names than those given by Mendaña.* It appears strange, however, that both Cook and Forster, having discovered the coincidence in the five islands, should not have attempted some westerly examination in 1774.

The population of the whole group, as at present computed by the resident French and English missionaries, amounts to 15,000. In 1774, Forster computed those inhabiting the five islands only at 100,000! and later authorities have reduced the whole group to 40,000. I place great reliance on the missionary statement.

Our visit confines us, of course, to the island of Nuhuhiva and Port Anna Maria of Hergest, but it is nevertheless incumbent on me to state all I hear, leaving it to my readers to draw their own inferences. Much of our information has been derived from the assistance of the British missionary, Mr. Thompson, as well as from questions put to the native chiefs through our pilot.

I am also aware that these people have been described by abler pens, and under greater advantages, perhaps, than our short visit and the nature of our occupations would seem to permit. It is nevertheless necessary to register our remarks; we may not see with the eyes of others—important changes may have occurred—and, moreover, to men of habits of investigation many new features may present themselves. Unfortunately, the volumes of former navigators were not in our possession, to enable us

* Voie R. Forster, Obs. Phy. Geog., Nat. Hist., &c.

to draw strieter comparisons; but, on the other hand, they could not bias our observations.

I cannot, however, exactly coincide with the summary character given in the five lines of the Geographical Encyclopædia, unless indeed they are to apply to the Polynesian Islands, or savages in general. That description comprises in five words—bold, ferocious, unchaste, fiendly, and bloodthirsty.

Upon none of these charges do I intend to defend them, although circumstances afforded me, perhaps, a better opportunity of seeing them nearer their own characters than those who have preceded me.

I have already alluded to the warlike dispositions exhibited at the period of my arrival. I was, indeed, anything but a welcome guest; yet, I immediately threw myself amongst them, and during my endeavours to stop the disposition to battle, had an opportunity of watching for those malignant passions in their leaders which could justify such harsh epithets.

What was the reply of the king to my question—If you are victorious what is your final intention? "To remove part of the Taioa people to this valley, and place part of mine there." This needs no comment.

On the other hand, let us look to the enemy at Taioa Bay. What was their reply to our mission? It was found, indeed, that they presented a superior race, not demoralized by the visits of whale ships, nor excited by intoxicating liquors, kava, or priestly instigation. They calmly awaited their threatened invasion, but without any hatred to their enemies. Their reply was, "That they would gladly receive the king 'Moana' as a friend,

and feast him, but not as their chief: at the same time they would defend their valley with vigour."

When war has once commenced, "and foe meets foe," who shall decide upon what is brutal or blood-thirsty? Look not too closely into the battle field of Europe, or of civilized combatants. Cruelty, the inherent type of every savage, will be exercised according to the custom of the country, and until these people become civilized, their nature will be savage.

I think, however, that the generality of visitors ascribe less of the savage to this group than elsewhere; and a case in point, I think, will bear this out. In the case of the captain and mate of a whaler, not many years since cut off by the natives in Comptroller's Bay, the Teii, said to be the most ferocious on the island, seldom communicating with their neighbours, and never with foreigners, —how did they act? They amused themselves by exciting their fears. Having made a fire sufficiently large to bake them, a hog was substituted, which, when cooked, they were invited to partake of. They were afterwards ransomed. On no other island would their lives have been saved.

Every navigator has agreed in describing the men as well-formed, active, and powerful. Their muscles are beautifully outlined, and the whole frame presents a roundness, fulness, and firmness, unusual in the Pacific. They resemble the Moors of the Morocco coast in this respect. Their gait and carriage is particularly erect, easy, and independent—proud, I should say; reminding one of the high-bred horse. So much do they feel this superiority over visitors, that they ridicule the gait of

Europeans. The expression of the eye is keen, but invites, or almost demands, friendship: no stranger can resist the extended hand and gaze of the better class, without being wanting in good feeling. Once *adopted* as a friend, or names exchanged, your interests are closely watched, and carried to a higher pitch of disinterestedness, than can be found amongst the so much extolled Tahitans.

There is evidently a great variety in the breed, the hue varying from that of a tanned European to the darkest West Indian. Their hair is long, flowing, or curly, and generally dark. They are tattooed to the extreme, but I do not think so delicately or beautifully as I have noticed at Tahiti. Here it is almost in masses of bluish black, which gives a darker hue to the appearance; more warlike but less ornamental. They wear nothing but the customary maro round the loins, similar to all the Polynesians. When dressed for war they are truly ridiculous.

The head is cumbered with a scull-cap of heavy network, ornamented with the jumbo bead and mother-of-pearl plates, and surmounted by a set of fan-plumes of cock's feathers, which form a semicircle, of which the extremes of the shoulders form the diameter; around the neck a string of heavy whale teeth,* with the points projecting forward. Above the maro on the waist a profusion of tappa; in the right hand a musket, and in the left the large Marquesan *fan*. How they are to fight thus rigged is incomprehensible.

* Similar ornament worn at the Feejees.

Three friends of the queen dowager, wishing to surprise me, suddenly darted into my path, thus accoutred. It is probable they thought to startle me, but it was too ridiculous to create anything beyond laughter.

They are indolent in the extreme. Their wants are few, and supplied, in a great measure, by nature. With the exception of the cultivation of yams, plantains, and the bread fruit, their time is wholly devoted to ease and enjoyment. Occasionally they fish, but to little extent.

Their canoes are very indifferent; far inferior to those of any other islands where trees of sufficient growth abound for their structure.

On my first arrival I did not experience much civility from the king, high priest, or prime minister. Their dislike was natural. I had lowered them much, by denying any hope of aid, in force or countenance, from Great Britain, or any civilized nation. However, they gradually found their rambles terminate at my tent; and several hogs and presents of fruit at length oozed out. We were much disappointed, however, in general supplies of this nature, as nothing but muskets would be taken in exchange.

Possibly a stronger political feeling kept these three from openly exhibiting their friendship. The queen dowager was averse to the war; her party opposed it, and she was known to be my great ally. They even asserted that she had sent the enemy powder and arms, which I had furnished.

The female part of the creation have generally been extolled as the finest models in the world. The first discoverers described them as possessing regular fea-

tures, fine hands, beautiful feet, of elegant stature; and, moreover, surpassing the most beautiful women of Lima. What Lima may have exhibited in 1595 we cannot exactly arrive at; but, at the present day, the comparison will not bear repetition. We were not fortunate enough to see any of these extraordinary beauties.

Their features are regular, complexion good, teeth perfect, hands neat, but feet far from elegant. Indeed, the term elegant, as applied to woman, does not belong to any condition out of the sphere of civilization. In stature they vary considerably; from the sylph-like Spaniard to the substantial English bouncer. Of the latter order was the king's sister—who was well able to take her own part. Undoubtedly they are the finest of the sex we have met in Polynesia. The peculiar brilliancy of the eyes and teeth, added to a soft languor of expression, which is seldom witnessed in polished society, has, I fear, bewildered the senses of their first visitants. They evidently witnessed more than we did. None of the extraordinary advances or improprieties charged against them were displayed. They are also charged with want of affection or attachment. Of course we are not in a condition to negative this charge; but I should, from personal observation, suspect this to be unfounded. In the instance of the queen dowager, she pretended, at all events, to doat on the memory of Commodore Porter; displayed his presents and picture with a tear in her eye, and repeatedly inquired if I knew him. She is now rather old. At all events, grateful recollection remains.

In another case, where I had to investigate a serious quarrel between two English residents, the case evidently hinged upon conjugal affection. I have also remarked very great attachment towards each other. Other strong cases were related by the pilot. On the other hand, I think it not a little remarkable that, looking on either hand at Tahiti, Sandwich Islands, or the Navigators, we notice marriages contracted with native women; if the females, then, of the Marquesas bear such characters for beauty, surely it is strange that we do not observe them transplanted to some of those islands, or to the American continent.

Their dress is very simple. A few folds of native cloth round the waist form a petticoat; and a kind of shawl of similar material, gracefully passed obliquely across the body, completes their costume. They are particularly fond of bathing; and in this respect exhibited a proof of modesty, by selecting unfrequented spots. There are always exceptions.

One great peculiarity the females enjoy at these islands is, their freedom from danger in war. They are considered as flags of truce, particularly chief women; and can pass from side to side at pleasure.

They are not subject to the exemption of eating with the males, as formerly in Tahiti and the Sandwich Islands.

With respect to their religious amelioration, I much fear that the day is yet distant when they will be brought into comparison with Tahiti. There is no *power* to lead, no king to command; and they are too impatient of resrtaint to listen to the missionaries.

Another strong reason against any important change, is their original loose worship of images. Had they been accustomed to place faith in the heathen worship, as in other islands, their minds might have been directed to a more powerful source to which they should address their prayers.

No. IV.—KUIKAHI.

Articles made and agreed on at Honolulu, Island of Oahu, this 16th day of Nov. 1836.

Art. 1st. English subjects shall be permitted to come with their vessels and property of whatever kind to the Sandwich Islands; they shall also be permitted to reside therein as long as they conform to the laws of these Islands, and to build houses and warehouse for their merchandize with the consent of the King, and good friendship shall continue between the subjects of both countries, Great Britain and the Sandwich Islands.

Art. 2nd. English subjects resident at the Sandwich Islands are at liberty to go to their own country or elsewhere, either in their own or any other vessel, they may dispose of their effects, enclosures, houses, &c., with the previous knowledge of the King, and take the value with them without any impediment whatever. The land on which houses are built is the property of the King,

He mau olelo keia i hooponoponoia'i a i hoopaaia'i ma Honolulu ma ka Moku Oahu i ka la umikumamaono o Novemaba, 1836.

Pauku 1. E aeia mai ko Enelani mau kanaka e hele mai i ko Hawaii pae aina me ko lakou mau moku a me ko lakou waiwai, o kela waiwai o keia waiwai; e aeia mai hoi lakou e noho ilaila, i like no ka loihi o ka manawa e noho pono ai malalo o ke kanawai, a e kukulu hale e noho ai a me na hale e malu ai ko lakou waiwai, ke ae mai ke alii; a e mau ke kuikahi maikai mawaena o na aina o Beritania Nui laua me na aina o Hawaii nei.

Pauku 2. He mea pono i na kanaka o Enelani e noho ana ma Hawaii nei e hele i ko lakou aina, a i na wahi e ae iluna o ko lakou mau moku a iluna o na moku e ae paha; e hiki ia lakou ke kuai lilo aku i ko lakou waiwai, na pahale, na hale a me ia mea ae ia mea ae, ke lohe e ke alii, a e lawe pu me lakou i ka dala o ia mau mea, aole mea iki e keakea ai. Aka o ka lepo malalo

but the King shall have no authority to destroy the houses, or in any way injure the property of any British subject.

Art. 3rd. When an English subject dies on the Sandwich Islands, his effects shall not be searched or touched by any of the Governors or Chiefs, but shall be delivered into the hands of his executors, or heirs if present, but if no heir or executor appear, the Consul or his agent shall be executor of the same: if any debts were owing to the deceased, the Governor of the place shall assist and do all in his power to compel the debtors to pay their debts to the heir or executor, or the Consul, in case no heir or executor appears, and the Consul is to inform the King of the death of every British subject leaving property upon the Sandwich Islands.

Kamehameha III.

Ed. Russell, Captain of H. B. Majesty's ship, Acteon.

iho i kukuluia'i na hale no ke alii ia, aole nae e hiki i ke alii ke wawahi i na hale a e hana hewa iki i ka waiwai a kekahi kanaka o Beritania.

Pauku 3. A i make kekahi kanaka o Enelani ma ko Hawaii pae aina, aole e huliia kona mau waiwai, aole hoi e hoopaia e kekahi o na Kiaaina a me na'lii, aka e haawiia i ka lima o na mea ana i kauoha ai a i kona mau hooilina paha, ina paha lakou maanei, a i ole ikea ka hooilina a o ka mea i kauohaia ai paha, alaila e lilo ke Konakele a o kona hope paha i mea nana e hooponopona ma ia mea; a ina he mau aie ka kekahi i ka mea i make aku la, e kokua ke Kiaaina o ia wahi, a e koi aku, ke hiki ia ia, i na mea aie e hookaa i ka lakou mau aie i ka Hooilina a i ka mea i kauohaia'i paha, a i ole ikea ka Hooilina a o ka mea i kauohaia'i paha, alaila e ukuia'i i ke Konakele. A na ke Konakele e hai aku i ke alii i ka make ana o na kanaka Beritania a pau, nona na waiwai e waiho ana ma keia pae aina.

Kamehameha III.

Ed. Russell.

THE REGIONS OF VEGETATION;

BEING

AN ANALYSIS OF THE DISTRIBUTION OF VEGETABLE FORMS
OVER THE SURFACE OF THE GLOBE

IN CONNEXION WITH

CLIMATE AND PHYSICAL AGENTS.

BY

RICHARD BRINSLEY HINDS, Esq.
SURGON, R. N.
ATTACHED TO THE EXPEDITION.

ADVERTISEMENT.

Her Majesty's ship Sulphur was the school in which I more particularly studied geographic botany. Preconceived views, and results drawn from the perusal of the writings of scientific travellers, were here practically tested. Her extensive voyage, and rapid transition from one portion of land to another, afforded rich and most favourable sources of comparison. With a bias towards the subject, it was an occupation of delight to develope the principles of the study, and to apply them to a result. Climate is the basis on which the earliest data must be founded, and with the liberal use of instruments, observations on temperature and humidity were in time collected. These, with observations on the physical condition of the surface, furnish us with many of the circumstances which govern the distribution of the flora of the world. What I have accomplished under these heads has been collected together, and form the subject of a lengthened paper, which, through the liberality of the proprietors of the Annals of Natural History, has been already published. Naturally following the consideration of physical agents, were the subjects of original distribution, amount, relative proportion to space, and similar details; but which I have not yet ventured to make public.

The result of these investigations was the developement of regions of vegetation, and which had their origin and stability in previously established views. At the same time, I do not insist that these are natural, but that taken in their entireness, they present in situations circumstances of remarkable individuality. In the meantime they will be found eminently useful in studying the features of vegetation, and more particularly in leading the subject to the naturalization of plants—the great end and aim of geographic botany.

My views respecting these regions have been more fully dwelt on in Sir W. J. Hooker's Journal of Botany for June 1842, and our space here does not permit me to enter on these at a greater length. It is enough to add that these regions are the results of observations matured during the voyage, and that with fourteen of them I have been practically acquainted.

R. B. H.

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THE

REGIONS OF VEGETATION.

I.—THE GREENLAND REGION.

Extent.—An important portion of the northern hemisphere is occupied by a vegetation entirely without trees, and covering a dreary, bleak, inhospitable surface, hardly capable, even in the most favoured spots, of any cultivation. Greenland composes much of this, and the region further comprises that part of America to the north of a line commencing at Hudson's Bay in 60° N. lat., thence stretching to 68° at the Mackenzie river, and continued to Behring's Straits; with that part of Siberia to the north of 65°, and Iceland, Spitzbergen, and Melville island. The natural course of this line is with the forest, obeying its sinuosities and sweeps, and will be found to enclose a region of some peculiarities. The northern limit of course only ceases with the vegetation.

Physical Characters.—The surface is usually extremely rocky and rugged, destitute of soil, and maintaining its flora in sheltered valleys and ravines. It is now a re-

ceived fact, that all those plants mutually existing in the northern parts of Europe and America are found in this region; hence it seems to have been a region of transmission, and to have been eminently active in supplying the northern parts of these two portions of the globe with many plants in common.

Climate.—There are but two seasons, summer and winter, which succeed each other with surprising rapidity. The latter is severe and protracted, and occupies a large portion of the year; summer suddenly follows on its decline, and from the now protracted presence of the sun much heat is accumulated. The activity of the vegetation would appear to be in proportion to the duration and completeness of its dormant condition, and is very characteristic. In Greenland, the range of the thermometer during the year is from 84° to—48°, or 132 degrees.

Flora.—Shrubs compose the larger vegetation; they are not the large bushy plants known as such in temperate and warm climates, but are of dwarf stature, and appear to be struggling against the elements to attain that state which nature has destined them to assume; thus some of them are only a few inches high; still they are numerous, and have sometimes showy flowers with brilliant colours. Leguminosæ, umbelliferæ, caryophylleæ, and cruciferæ, have a smaller share in the vegetation than might be expected; but ranunculaceæ, saxifrageæ, and ericaceæ, hold a more important station, and the proportion of gramineæ has greatly increased. It is, however, among cellulares that the greatest change is manifest, particularly in musci.

Greenland has a flora of 403 species, of which 172 are phenogamous, and 231 cryptogamous. These are distributed among 137 genera and 45 natural families. On analysis, the phenogamous species are found to be in proportion

to the genus as 2 to 1, the cryptogamus as 4·5 to 1; taking the whole flora, the value of the genus is 2·9, of the natural family 3; of the phenogamous genus 2, of the cryptogamous 4·5; of the phenogamous family 2·3, of the crytogamous 7·3. The genera have few species compared with Iceland; saxifraga, draba, ranunculus stellaria, cerastium, epilobium, pedicularis, eriophorum, juncus, carex, and salix, being the only phenogamous genera with more than three species. There are no trees; pyrus aucuparia reaches 61° as a small shrub, and about a dozen species are peculiar.

Iceland, situated between 63° and 68° N. lat., has 652 species. Of these, 359 are phenogamous, and 293 cryptogamous. Umbelliferæ constitute 109th part, leguminosæ 81st, cruciferæ 40th, compositæ 33rd, and gramineæ 15th. The most numerous phenogamous genera are salix, saxifragea, ranunculus, gentiana, veronica, potamogeton, plantago, epilobium, rumex, polygonum, geranium, hieraceum, gnaphalium, orchis, carex, juncus, agrostis, aira, poa, festuca.

Melville island, in 75° N. lat., has 116 species distributed between 22 families; or of phenogamous plants 67, and of cryptogamous 49. A few of the species are not found elsewhere, and it may have a genus of its own, at present an unsettled point.

Relations.—The most interesting are with the three upper regions of alpine vegetation, where many of its characteristic features reappear.

II.—THE NORTH-WEST AMERICA REGION.

Extent.—The rocky mountains and Pacific Ocean on the east and west, and 68° N. lat., and the Columbia river to the north and south, enclose this region.

Physical Characters.—The surface is irregular, consisting entirely of mountain and valley, without the least pretensions to plain; the former composed chiefly of primitive rocks, among which granite is abundant, quartz is sometimes seen, and rarely, I believe, limestone. The soil is often rich, from the great accumulation and rapid decomposition of vegetable remains.

Climate.—Being freely exposed to winds from the ocean, and westerly winds prevailing, the climate is considerably modified. Compared with Europe, it is far cooler for the latitude, and with the opposite coast without those extremes so common there. It is, however, much more moist than either, and the rainy days are very frequent. In 56° N. lat., the mean temperature has been ascertained to be 45°5, and the range of the year from 2°3 to 81°9. Only thirty-seven really clear and fine days were experienced, on forty-six snow fell, and on the rest more or less rain. This was at Sitka, or New Archangel. At the Columbia river in 46° N. lat., being the southern limit, and with an interval from the above of ten degrees, the mean-temperature is 54°, the annual range from 18° to 92°, number of rainy days 157, the quantity of rain 53·6 inches, and snow is rarely seen.

Flora.—Though the inequalities of the surface are great, soil is abundant, and the investing vegetation vigorous. The constant moisture favours premature decay, and thus the trees are early undermined, and falling from their ranks in the forest, cover the ground in vast numbers. It is not easy to conceive how thickly the surface is crowded with these, unless by recalling something like the vast accumulations of the coal measures. Within the tropics I have never seen anything equal to the scene of devastation the northern part of this region presents; trunks of trees, of great length and clear of branches,

are seen on all sides strewed in tiers, and covered with a dense agamic vegetation. It would often seem that they were unable to attain a good old age, as, always exposed to moisture from the repeated rains, they have yielded to its influence immediately that period of life arrived when the activity of vegetation diminishes. Here everything is moist, the soil is completely saturated, mosses and lichens are in their liveliest vigour, and much of the surface is swampy.

Tracing the regions from Prince William's Sound in 6° north latitude to the east, and then to the south, the whole will be found to be covered with one vast forest. It extends to the north as far as the boundary line, and to the south, through several degrees of latitude, to the Columbia river, where a sudden change occurs, and which is a very decided line of demarkation between this and the California region. Returning for a moment to Prince William's Sound, a tongue of land stretches from it to Oonalaska and the other islands of the Aleutian chain, over which there is no forest, and the only approach to trees is a few stunted spruces in the sheltered valleys. But the vegetation is very luxuriant, and towards the close of summer the roses, willows, and lupins form a dense mass not easy to penetrate. At this time, on the sides of the lower mountains, sustaining towards their summits irregular patches of snow, there is a richness and quiet beauty about the flora particularly attractive, for many of the flowers are showy, and their colours clear and brilliant. Here especially are mimulus luteus, geranium eriostemon, lupinus nootkatensis, making the surface quite blue with its flowers, epilobium latifolium, polemonium humile, and some ferns and grasses, many of the latter of which are in common with Europe. Elsewhere the forest, though dense, consists of but few

species; abies has three, which, with cupressus thyoides, constitute all the larger trees, whilst some smaller are contributed by cratægus, salix, cerasus, betula, and to the south diospyros.

The undergrowth of shrubs is so extremely luxuriant, that it appears a chief characteristic, and, regardless of the shade of the forest, flourishes in great vigour. These shrubs are chiefly the species of vaccinium, menziesia, rubus, and ribes, which, though numerous in species, have a multitude of individuals. Towards the south, lonicera involucrata, mahonia glumacea, symphoria racemosa, gautheria shallon are superadded, and particularly aspidium munitum, a handsome fern, very social, and covering portions of the surface to the exclusion of others. Another peculiarity is, that though some of the genera appear through several degrees of latitude, they are continued by new species; thus ribes, rubus, rosa, and lupinus, are seen everywhere in the region, yet each species had but a small range, and is immediately succeeded by another.

Relations.—Two plants are common which are eminently distinguished for their large foliage, and as members of families of a warmer climate; panax horridum, a fine shrub with large showy leaves, upwards of a foot in length, has a range of growth from 45° to 61° north latitude; and dracontium camtschaticum, with a very different habit, spreading its broad leaves over the surface, on the under side of which is usually a small hairy helix, abounds in moist situations from 61° north latitude to the Columbia River, or 46°19′. Mimulus guttatus has a wide habitat, extending from 59° 30′ north latitude to 37° in California. The herbaceous plants are of families common to these latitudes, though both cruciferæ and umbelliferæ are scarce, and the genera are

similar to the European with few exceptions. The southern part mixes but feebly with the California region, and the features are preserved singularly intact even to the banks of the Columbia. Here quercus commences with many others, abies ceases suddenly, and pinus partly supplies its place, nor disappearing from the elevated lands till it arrives in the vicinity of Panama. A collection of plants from its northern part contained about one half common with the north of Europe, and a similar number with Siberia.

III.—THE CANADA REGION.

Extent. — To the west the Rocky Mountains, and to the east the Atlantic Ocean; in the south a line commencing on the coast in 44° north latitude, thence to the margin of Lake Erie and to the Mississippi, then taking a north, and afterwards a north-west direction by the north branch of the Saskatchawan river to the Rocky Mountains. Its northern outline is irregular, being determined by the forest; towards Hudson's Bay it crosses the country in 60° north latitude; but attains a higher latitude to the west, till it reaches 68°, near the Mackenzie River.

Physical Characters.—Much of this surface is covered with forest. There are no important mountain chains, though smaller ranges separate several large plains. These have generally a fruitful alluvial soil, but wild rocky districts are not uncommon, too dreary and inhospitable to support a vigorous vegetation. The primary mountains of the Iroquois region pass its southern boundary, and separate some plains in the vicinity of the lakes and the St. Lawrence, the luxuriant fertility of which,

according to Murray, is almost unsurpassed, and whose characteristics are limestone rocks, waters highly charged with calcareous matter, and copious deposits of gypsum and marl. Nova Scotia, New Brunswick, and the islands, form an important portion of the region. Here granite, clay-stone, sandstone, and limestone, constitute the basis on which the soil reposes. In Prince Edward's Island the soil is fertile, and though occasional masses of granite occur, scarcely a stone or pebble is to be seen; sandstone is the basis of the island, and clay abounds. In Newfoundland the surface is more rocky, secondary formations prevail, with coal and various sandstones. Of Labrador little more is known than that it is covered with a vast forest, and is unusually inclement for the latitude.

Climate.— This varies considerably, but is everywhere severe for the latitude. Like the United States the extremes of temperature are intense, and with the anomaly that the seasons of Lower Canada run into greater extremes than Upper Canada, or that the range is greater near the sea than inland. Summer and winter succeed each other so rapidly, that spring and autumn are not distinguishable. About the close of October, sharp frosts commence, heavy falls of sleet and snow occur in November, and this state of the weather prevails till the middle or end of December, when it rapidly yields to a clear sky and a frosty atmosphere, which continue till nearly the end of March. A rapid change now takes place; a fervid sun bursts forth, which melting the snows and unlocking the frozen streams, vegetation appears with magic haste, and every spot is beautiful and green with verdure. From May to September inclusive, a warm and oppressive summer prevails.

Flora.—Unlike the neighbouring Iroquois region, the

forest offers little variety in its trees, these being chiefly spruces, as abies alba, a. nigra, a. canadensis, with occasionally thuja occidentalis, pinus resinosa, and larix microcarpa. Mixed with these are several trees with deciduous leaves, but they do not extend quite so far north, nor so completely enter into the composition of the forest; quercus ambigua, betula papyracea, b. lenta, b. excelsa, populus balsamifera, p. tremuloides, p. grandidentata; and with limits something more southern, acer saccharinum, a. rubrum, fagus ferruginea, ulmus americana. A close compact forest is unfavourable to the humbler vegetation, and thus there is no great variety; and in the present instance is more particularly characterised by shrubs of cerasus, sambucus, viburnum, salix, rhodora, sedum, kalmia, ribes, rubus, rosa, and amelanchier.

Relations.—Among the herbaceous plants are many peculiar species, but almost always of genera widely diffused over other parts of the continent or of Europe. About half-a-dozen genera only seem peculiar. Wherever, during a portion of the year, the climate possesses considerable warmth, there will generally be found representatives of forms belonging more abundantly to warmer latitudes; here, accordingly, are met with two species of panax, two of aralia, and dracæna borealis.

IV.—THE IROQUOIS REGION.

Extent.—I have attempted, in the name of this region, to connect the memory of the brave Indians with the magnificent forests they once claimed as their own. The word was applied collectively to several tribes of North Americans, well known in their day as the Six Nations,

and closely concerned in the early political transactions of this country. They were the admiration of their cotemporaries, but nothing now remains of them, unless sufficient of their history to adorn a tale. Perhaps a few solitary descendants may be traced out, far from the land of their fathers, but no more. The forests themselves are disappearing under the thrift and industry of their greatest enemy, the white man; the trees that once sheltered the Indian lodge are falling beneath the axe of the regenerator; and the trackless forest, so often traversed by the skilful hunter and dauntless warrior, is now covered with corn-fields, canals, and railroads.

The boundary of this region commences on the coast of the Atlantic in 44° north latitude, and proceeds, just skirting the southern margin of Lake Erie, onward to the Mississippi. It now continues along the edge of the forest on its western shore, approaching it more closely at its mouth than in its northern course; and afterwards crossing Florida in 27° north latitude, with the Gulf of Mexico and the Atlantic Ocean, it incloses an irregular parallelogram of about 690,000 square miles.

Physical Characters.—This surface is unequally divided by the Alleghany mountains, which slope towards the Atlantic and the Mississippi. The latter has also a gradual and regular ascent from the Gulf of Mexico to the lakes of Canada, of 1,200 feet. Both of these plains abound in a fruitful soil wherever the forest has been removed, but superior fertility and excellence belongs to that between the mountains and the Mississippi. The mountain system, though attaining no great elevation, has a length of 1,200 miles, and occupies a belt of about one hundred, of which two-thirds are estimated to consist of valleys. It traverses the region obliquely from north-

east to south-west, and has an average height of between 2,000 to 3,000 feet, the highest summits never exceeding the latter. There are elsewhere some loftier elevations, Mount Washington being 6,428 feet, and the Black Mountain in Carolina 6,476 feet. The Alleghanies are divided into four distinct ridges, and are chiefly composed of primary stratified rocks. This stratification is very generally prevalent, and one of its effects is visible in the numerous cascades, falls, and rapids of the rivers. Gneiss, granite, sienite, and hornblende are frequent in the northern parts, and are equally the basis of the plains as of the mountains. Towards the south the granitic rocks in a great measure disappear, and are supplanted by an extensive limestone formation. Much of the surface of the plain between the mountains and the Atlantic is covered by sand, which in many instances is far more productive than might be imagined, from, it is supposed, a submersion to which it was formerly exposed. There are likewise extensive patches of marsh or moist meadow land, and nearer the sea occasionally inundated districts.

Climate.—With so wide an extent of latitude, there will be much difference in the climate. Generally it may be called a climate of extremes, particularly in the northern part, where this feature is experienced in greatest force. The vicissitudes are great, and accomplished with much rapidity; the extreme of heat and cold even in a single day is immense, and it has been known to be 41°; 28° is mentioned as common. After the hottest days, the nights may be piercingly cold. An American writer has summed up a detail of his climate by observing, that in spring it has the moisture of Britain, in summer the fervid heats of Africa, in June the bland warmth of Italy, in winter the snows of Norway and

the ice of Holland, the tempestuous winds of the West Indies, and in all seasons the variable weather of Great Britain. Such a combination is not likely to be favourable to the human race, but under it the vegetation is ndoubtedly varied and luxuriant. Plants love a warm atmosphere, especially if combined with brilliancy of the sun's rays; and a succeeding cold season, instead of proving hurtful, seems rather to prepare them to expand in the coming summer with unusual vigour.

Flora.—A vast impervious forest once covered the whole eastern part of North America. Towards the north it commenced around the shores of Hudson's Bay, reaching as far as 60°; and stretched towards the south in one broad mass, bounded on one side by the Atlantic Ocean, and on the other by the Mississippi, the father of rivers. It did not quite confine itself to the east side, but crossing the river, continued down its west bank in a belt of fifty or a hundred miles broad. The only interruptions throughout its extent were occasioned by two inroads of prairie, mentioned under that region. To the south it received no check till it arrived on the margins of the Mexican Sea. A portion of this forest comprises the present region. Beyond the northern boundary of the latter the forest consists of but few species, but to its south a new state of things prevails; for many new and extensive genera now contribute their species, and bestow an unrivalled variety. One hundred and fifty distinct kinds of trees are known, of which eighty attain an height upwards of sixty feet. Of these the most peculiar to the region are the various carya, nyssa, liriodendron, taxodium, robinia, and gymnocladus. A small part only of this forest has been removed; but where this has happened a material change has been produced in the vegetation. Its original herbaceous plants, which re-

quired shelter and protection, have disappeared from the clearings, and were replaced by strangers. But if the forest again resumes possession of the soil the old inhabitants return, to the exclusion of the intruders. The numerous species furnishing these trees are, with few exceptions, peculiar, and, including those just mentioned, belong to the following genera, many of them having several species:—Quercus, ulmus, pinus, juglans, diospyros, cupressus, acer, negundo, laurus, celtis, gleditschia, virgilia, magnolia, tilia, maclura, œsculus, pavia, corylus, fraxinus, ostrya, juniperus, morus, rhus, rosa, euonymus, rhamnus, hamiltonia, hydrangea, prinos, clethra, kalmia, cratœgus, comptonia, myrica, sorbus, halesia, berberis, olea, philadelphus, malus, cerasus, gordonia; but many of the latter are only shrubs.

Among herbaceous plants the most characteristic are, in *Labiatæ*, collinsonia, salvia, gardoquia, calamintha, hyptis, ceranthera, macbridea, monarda, cunila, scutellaria, hyssopus; *Scrophularineæ*, seymeria, gerardia, macranthera, herpestis, gratiola, pentstemon, orobanche, antirrhinum, mimulus; *Euphorbiaceæ*, croton, euphorbia, phyllanthus, jatropha, tragia; *Ranunculaceæ*, clematis, thalictrum, delphinium, ranunculus; *Compositæ*,—these are extremely numerous and varied; aster and solidago on which Schouw has erected a region, but they are assembled with so many others that it is giving them an undue importance; liatris, a characteristic group, helianthemum, coreopsis, rudbeckia, eupatorium, prenanthes, apogon, krigia, borkhausia, stokesia, vernonia, cacalia, hymenopappus, erigeron, arnica, verbesina, chaptalia, galardia, baldwinia, elephantopus, senecio, lactuca, cnicus, hieraceum; *Leguminosæ*, desmodium, lespedeza, indigofera, stylosanthes, baptisia, astragalus, tephrosia, lupinus, two species with simple leaves; trifolium is not

common; *Stellatæ*, houstonia, galium, rubia; *Polemoniaceæ*, phlox, polemonium; *Papaveraceæ*, sanguinaria, meconopsis; *Apocyneæ*, amsonia, anantherix, polyotus, asclepias, stylandra, apocynum; *Umbelliferæ*, eryngium, hydrocotyle, leptocaulis, daucus, tiedmannia; *Cruciferæ* are scarce, but hesperis prevails; *Thymeleæ* has only one representative; among *Orchidaceæ* are habenaria, corallorhiza, orchis, triphora, malaxis, cypripedium, cranachis, bletia, spiranthes, epidendrum; and of other endogenæ iris, phalangium, yucca, agave, canna, tradescantia, commelina, amaryllis, crinum, pancratium. To complete this sketch must be added, podophyllum, diclytra, claytonia, erythronium, mikania, smilax, vitis, polygala, hypericum, lobelia, ænothera, silene, arum, nymphæa, nuphar, vallisneria, villarsia, sagittaria, zizania, sarracenia, dionæa, drosera, oxalis, solanum, rhexia, several species, jussiæa, mitreola, spilegia, gentiana and sabbatia, various beautiful kinds, eriogonum, pleea-like dionæa with a limited habitat, warea, tiaridium, and numerous ferns.

A strong tendency exists in the southern portions to display tropical characters, as is evident from some of the endogenæ already mentioned, and is farther confined by tillandsia, bromelia, epiphytic orchidaceæ, chamærops palmetto, and other palms; sapindus, passiflora, turnera, bignonia, croton, and pontederia.

The monomic* families are very few, and are confined to podophyllaceæ, sarraceniaceæ, and limnanthaceæ; of genera 332 are monomic in North America, which is certainly a large number to have so limited a range. There are two which are singularly absent, erica and ficus; for the latter might be expected in the south, since it is so plentiful in the low lands of Mexico. The forest trees are so numerous, that was it our opinion that vege-

* Confined to one region.

tation was diffused from centres, we should almost consider this as that whence the temperate regions of the world had been supplied. Leguminosæ bear among them a great proportion for the latitude Others are remarkable for the size and brilliancy of their flowers; occasionally for their glossy leaves; and the autumnal tints of an American forest have long charmed the imaginative observer. Gramineæ are feebly represented, and to some extent their place is supplied by junceæ and cyperaceæ, which love the marshy lands.

The range of growth of some of the trees has been carefully observed. Quercus virens, the live oak, is found along the shores of the Atlantic and the Gulf of Mexico to the Sabine river, but not more than twenty miles from the sea, and ceases at 37° N. latitude. Quercus prinus, the chesnut oak, abounds in the Atlantic states south of 41°; q. stellata, the post oak, in Maryland, Virginia, and the upper parts of Georgia and the Carolinas, preferring a dry gravelly soil; q. montana, the rock chesnut oak, valuable in ship-building, grows in stony soils on the Hudson, Lake Champlain, and in the Alleghanies of Pennsylvania and Virginia. Juglans nigra is common in a deep and fertile soil south of 43°. Acer saccharinum, the sugar maple, ranges chiefly from 43° to 46°, but is common in some parts of Pennsylvania and Genessee. Besides sugar, it yields potash abundantly, good charcoal, and a valuable wood. A. nigrum, the black sugar maple, is found farther south, and chiefly abounds in the vicinity of the rivers of the west. It yields sugar freely, but is less generally useful than the former. Betula papyracea, the canoe birch, is a northern tree, not descending beyond 43°. B. lenta occurs from 40° to 48°, and farther south on the summits of the Alleghanies. B. nigra, on the banks of the rivers, from 41° to Georgia. Laurus

caroliniensis, the red bay, in swamps to the south of 37°. Diospyros virginiana is common in the United States south of 41°. Asimina triloba, the papaw, but not to be confounded with carica papaya, ceases at 40°. Populus angulata grows only to the south of 39°. Chamærops palmetto stretches along the coast of the Atlantic to 35°. This palm grows to forty or fifty feet high, and has some useful qualities. The wood is in request for wharfs and other submersed buildings, as it is not attacked by worms; it also will not splinter when struck by cannon-balls. Cornus florida only grows south of 43°. Nyssa villosa, the sour gum, south of 41°. N. biflora, the black gum, to 43°, and always in moist situations. Fraxinus acuminata abounds to the north of 41°, and its wood is so valuable for strength and elasticity, that it is exported. Ulmus americana thrives best from 42° to 46°, but is found generally. Its wood is inferior to the European. Pinus resinosa, the red pine, is not seen south of 43°. P. palustris, a valuable tree for its wood, its copious resin, and as occupying a very arid soil, commences at Norfolk, in 37°, and stretches along the coast for 600 miles, and with a breadth of 100. P. tæda, the loblolly pine, exclusively to the south of 38°. P. strobus chiefly between 43° and 47°; and the tallest kinds are used for the masts of vessels. Abies canadensis, the hemlock spruce, has the same range as the last. A. nigra, chiefly from 44° to 53°. Its wood is preferred for spars, and spruce beer is made from its branches. A. alba has a similar range. Thuja occidentalis, lignum vitæ, or white cedar, grows with the spruces. Taxodium distichum, the bald cypress, is peculiar to swamps south of 38°. Juniperus virginiana, the red cedar, prevails south of 44° in dry exposed situations.*

* For much of these details I am indebted to the interesting sketch of the

Relations.—This region is so rich in variety that very extensive relations might be expected, but though these are certainly numerous, the peculiarity of its flora is very striking. With Europe it might be supposed to have many species in common; yet of 2,891 phanerogamic, only 385 re-appear there. The proportionate scarcity of umbelliferæ, cruciferæ, and trifolium, is somewhat remarkable; and in examining the vegetation we cannot fail to be impressed how closely the productions of cold and hot regions are brought together, and consequently how much the intermediate temperate portion is compressed. This appears to be the reason why the groups just mentioned are so little seen. With the China region there are some interesting points of resemblance, through hydrangea, cocculus, and others; with South Africa in amaryllideæ, India in scitamineæ; and with the Patagonia and California regions through berberis, and many other genera with the latter. Clusia rosea is met with in Carolina, and several cinchonaceæ prevail through the region to the vicinity of the lakes.

V.—THE CALIFORNIA REGION.

Extent.—After crossing the Columbia river from the north, an entirely altered vegetation commences. The dense compact forests of abies cease suddenly, and are supplanted by an open country, spotted by occasional clump of oaks, and the river lines fringed by platanus, fraxinus, juglans, and salix. The outline of the region may

botany of the United States, as in the American edition of Murray's Encyclopædia of Geography.

be traced up the Columbia river to the Rocky Mountains, which it meets in about 50° N. latitude, and is continued along them to the south, till approaching the commencing waters of the Colorado, it runs along its course to the gulf of California. The remaining portion is circumscribed by the Pacific Ocean.

Physical Characters.—In its northern part the surface is regular, and there are some well-watered fine alluvial plains, without a rock or stone. Occasionally ranges of low mountains traverse it, chiefly of porphyry, basalt, and jasper, which are not of sufficient elevation to affect materially the vegetation, but support some groves of pinus lambertiana and abies religiosa; pinus rigida prefers the plains. The broad plains which separate them are often overflowed in the winter, which with their deep rich soil renders them very fertile. To the south, the scenery is wild and rugged, nearly altogether mountainous, the ranges running from north to south. Not a tree is to be seen, but there is a moderate sprinkling of a more lowly and interesting vegetation. The prevailing rocks here are serpentine, gneiss, basalt, and greenstone. There is no soil nor fertilizing streams, water being very scarce.

Climate.—To the north the climate is even and temperate; the winters are mild and of short duration, and snow appears on the loftier hills; and the summers have an agreeable warmth, with the atmosphere clear and transparent. In the autumn the dews are excessively heavy. The summers of the southern portion are warmer, the temperature being generally from 60° to 74°. The rains are soon over, but during their continuance deluge the country. The atmosphere is particularly clear, and it would also appear dry, as when signs of the

wet season were gathering in the heavens, the dew-point was 62°, the shade 72°; and at the same time the sun's rays were 115°.

Flora.—The finest part of this region is to the north, where an open country prevails, varied by patches of trees of noble growth. Of the oaks, two species are deciduous, and two evergreen. The latter are confined to the neighbourhood of the sea coast between 38° and 34° N. latitude. The other trees are not numerous, and are chiefly comprised under platanus, acer, pavia, juglans, cornus, laurus regia, and the aromatic tetranthera californica. It is among these forest trees that the chief relations with the Iroquois region is established, and it is one of affinity. The undergrowth consists of several species of rubus, ribes, lupinus, rhus, vaccinium, arbutus, and lonicera; and such is the variety of some of these, that a new species may be met with almost every hundred miles. Vitis, scarcely expected, grows abundantly on the margins of some of the rivers. Shrubby compositæ prevail throughout, but are in the greatest intensity towards the centre of the region; and in the more arid parts cacteæ and euphorbiaceæ are particularly numerous, with a few leguminosæ. Cacteæ are not seen further north than 34°; here also is the limit of ricinus communis, of course introduced, as is phœnix dactylifera, a few large trees of which may be seen about San Diego, but only yielding a sour fruit.

As characteristic peculiarities of the region may be mentioned, its great aridity, general scarcity of trees, superior prevalence of cacteæ, compositæ, and euphorbiaceæ, great number of plants with lactescent juices, and with fragrant foliage, the frequent developement of the flowers and leaves at different periods, and the general small range of its species. The negative features consist

in the scarcity of ferns, mosses, and fungi, none of which exist in the southern part, except perhaps the latter during the rains. Lichens, with sickly aspects, occasionally cling to the trees or rocks.

Relations.—California, though less known, has an equally fine climate with the south of Europe, Chili, the Cape of Good Hope, or New South Wales; and with these parts of the world has a general resemblance in its vegetation. In establishing a comparison between the western and eastern parts of the American continent, a superiority must be assigned in the forest trees to the east, and in the herbaceous vegetation to the west.

VI. THE PRAIRIE REGION.

Extent.—This is a peculiar tract enclosed by the vast forests of North America. It extends from within a hundred miles of the west bank of the Mississippi to the Rocky Mountains, stretching to 54° N. latitude, and again only bounded on the south by the wooded country of the Texas and the Mexican Sea. The outline is tolerably regular, except that two processes cross the above river; one penetrating the states of Illinois, Indiana, and Ohio; and the other farther south, stretching into Alabama.

Physical Characters.—The prairie is far from being a continuous extensive plain, and in this respect must yield to the Pampas. It consists rather of an assemblage of plains, often with slightly undulating surfaces, and frequently covered with a fruitful soil; their level being occasionally broken by projecting masses of rocks or ranges of low hills. The subjacent structure is composed of red or grey saliferous sandstone, chiefly the

former, with beds of clay. Chloride of sodium abounds with other salts, and are found largely in the vicinity of the Rocky Mountains, and in the northern part of the region. Gypsum likewise occurs, and gravel, sand, or boulders occasionally prevail.

Climate.—The long droughts to which the prairie is liable have been supposed to preclude the existence of shrubs or trees, and to be favourable to the more fugacious grasses. Heavy rains sometimes fall, and during their continuance rivers spring up, and gliding over the country, nourish a lively vegetation. In the dry season these soon shrink to small streams, disconnected chains of ponds or marshes, or entirely disappear.

Flora.—This extensive portion of country supports a by no means insignificant flora. Gramineæ is the most important group, and is represented by numerous festuca, bromus, stipa, aristida, poa, agrostis, crypsis, kæleria, hordeum, eriocoma, and others. Grasses flourish more particularly in the northern part, yielding gradually towards the south to various herbaceous compositæ, some cucurbitaceæ, vites, scrophularineæ, solaneæ, borragineæ, and euphorbiaceæ. The peculiarities of the region are derived chiefly from the absence of trees, the great preponderance of gramineæ and of compositæ through the genera rudbeckia, helianthus, silphium, coreopsis, and other allied groups, and in the scarcity of bulbous plants in a situation, where, from a comparison with the Cape of Good Hope and other places, they might be supposed to exist. Cacteæ appear farther north in the prairie than in the California region, and are often accompanied in both by a yucca.

However interesting the Rocky Mountains may prove to the geologist, they have no flora sufficient to give them any individuality as a region. They are as destitute of

arborescent vegetation as the prairie, and the interesting herbaceous plants found among them are only a portion of this flora. If their latitude generally is considered, they will be found incapable of possessing any important alpine vegetation, and even around their bases the snow will lie long and perseveringly on the ground.

Relations.—Towards the south this region becomes gradually blended with the California and Chihuahua regions: an analogy with the pampas is established through the numerous gramineæ; and with the northern regions by numerous cruciferæ and umbelliferæ, but those of the prairie are nearly all peculiar. The more interesting relation exists with the Steppes of Tartary, with which it has many points in common. The chief relation is that of affinity, the same genera being represented in both by different species; among these are artemisia, astragalus, thermopsis, sophora, glycyrrhiza, fritillaria, and diotis; and rheum is replaced by the analogous genus eriogonum.

VII.—THE CHIHUAHUA REGION.

Extent.—This name is pronounced Chi-wah-wah, and though the designation may appear somewhat novel, on the spot it is in extensive use; but almost equally little is known of the inhabitants, productions, and flora. On account of the barrenness of information respecting the latter, we can hardly more than indicate this region. Though an important portion of Mexico, it differs from it in many respects, and it is necessary to draw a strong line of demarcation, since the very name of Mexico is apt to convey to the mind of the botanist an association of characters certainly not pertaining to this part of the

republic. On the north it has the Prairie Region, sweeping round it even to the shores of the Gulf of Mexico, and meeting the Central America Region, thus completely separating it from the Atlantic. To the south, it ceases about the limit of the tropic, and on the west it has the Gulf of California, and the Rio Colorado.

Physical Characters.—Bold and mountainous.

Climate.—Cold for the latitude, and apparently liable to vicissitudes.

Flora.—A thin forest occasionally covers part of the surface; at other times the vegetation is lowly, and there are broad spots entirely without any. The general character is rugged and austere, the land rising rapidly to a moderate elevation. Hence the climate is cool for the latitude, and the productions those of ten or fifteen degrees farther north. Steep precipices, and narrow passes abound, with the customary attendants of stern mountain scenery. Between the various ranges are fertile plains well adapted to agriculture, and the valleys are often very productive. Nitre and common salt are sometimes mixed copiously with the soil, depriving it of fertility. Compositæ are numerous; some are shrubby, but the tribe coreopsideæ more particularly prevails. Cacteæ are common; a few amaryllideæ, some showy and interesting spieces of labiatæ, and perhaps also of scrophularineæ and boragineæ.

Relations.—Unknown.

VIII.—THE CENTRAL AMERICA REGION.

Extent.—The southern portion of the republic of Mexico, the whole of the Federal States of Central America, and a portion of New Granada; it thus extends

from the north tropic to the Gulf of St. Michael in the Bay of Panama, but sends a tongue to meet the Prairie Region, on the Mexican Sea. In elevation it attains 4,500 feet, or the commencement of the cultivation of wheat; and the lowland cultivation ceases about this, which is inconsiderable for the latitude. Humboldt's warm region ceases at 600 metres, or 1,968 feet, but this is no limit to either the introduced or natural productions.

Physical Characters. — That part comprising the Mexican States, and the Upper States of Central America, rises rapidly from the shores of both seas to the elevated and peculiar table-lands of this part of America. Near both shores the soil is productive, if not abundant, but on leaving them the surface is usually rugged, and broken by huge masses of granite, porphyry, serpentine, or bazalt. This part of the region is composed almost entirely of these primary rocks, very few of secondary formation being known to exist. More to the south, and near the Isthmus of Panama, the country is far more even, the continuity of the Andes being completely broken, and in the vicinity of the lakes of Leon and Nicaragua is so even that no perceptible inequality can be noticed on traversing it, and the greatest difference is nowhere more than a few yards. Here the soil is rich and abundant, very productive, and capable of yielding many successive crops.

Climate.—The seasons are tropical, the rains commencing from April to June, according to the latitude, and lasting five months. During the rest of the year a hot sun and clear sky prevail.

Flora.—This region belongs to that variety of tropical vegetation where leguminosæ, &c., prevail, and hence we infer a certain aridity of soil and atmosphere. In this respect it yields greatly to the Oronoco Region, and

though Schouw combines them in his anomalous region of Cacteæ and Piperaceæ, I venture to separate them, after some practical acquaintance with both. Everywhere a forest exists, but it is usually a thin open forest: the trees are not distinguished either for stature or bulk, and there is a scarcity of undergrowth. In this latter respect there is a very remarkable difference between it and the North-West America Region. Nor is the variety of the forest trees great; hæmatoxylon campechianum is common; swietenia mahagoni and cedrela odorata are gregarious in the neighbourhood of the lakes, and very numerous as individuals. Mimoseæ are particularly abundant on the summits and sides of the hills, where there is any exposure, and the larger kinds convey a particularly airy and picturesque effect. Bauhinia, hymenæa, and schrankia, have several species. Ficus is also numerous, and from the manner of growth is highly distinctive; one species has a strange partiality for encasing the trunk of the chamærops palmetto, of which instances are numerous. Tropical endogenæ are not frequent, a few scitamineæ, musaceæ, and commelineæ appearing only in the wet season; passiflora, piper, melastoma, and ferns, are not common; cacteæ are spread over the region, but are not in such vigorous existence as elsewhere. Agave americana, salvia, hyptis, asclepias, viscum, loranthus, mikania, cordia, geraschanthus, heliotropium, tournefortia, quassia, datura, and solanum, are most frequent in the vegetation. Palmæ are almost comprised in chamærops palmetto, bactris minor, cocos nucifera, a licuala, and a phœnix.

Relations.—The extensive existence of ficus is a source of resemblance with the Indian forest. Cacteæ are very generally diffused, though never in any intensity, and through them a general character is maintained

with all America, subject to a warm or even temperate climate. It yields to the West India Region in the number, variety, and luxuriance of its vegetation, but its closest connexion is here; also to the South American tropical regions; and, considering its situation, is far from being rich or productive. Within it, it must be remembered, is an alpine region, and the celebrity the flora has enjoyed is shared between them. On the west coast, in 19° N. latitude, I saw a solitary tree of metrosideros glomulifera, which conveys an interesting relation with New Holland.

IX. THE MEXICO ALPINE REGION.

Extent.—The Mexican mountains, above 4,500 feet, between 12° and 22° north latitude. This height is the lower boundary of the cultivation of wheat, and on the elevated plains it thrives admirably, when fed by regular irrigation. Since latitude within the tropics has such a trifling influence on climate, the difference in the alpine range of growth of vegetation on the mountains of Mexico and the Ecuador is surprising. In the latter, Quercus is not seen lower than 5,800 feet, but in Mexico it commences suddenly at 2,700 feet.

Physical Characters.— The distribution of the Mexican highlands is remarkable. Instead of rising gradually to a lofty sierra or ridge, as in the Andes of South America, the ascent suddenly ceases in a broad expanded tableland with an elevation from 4,000 to 8,000 feet. On this are placed many active volcanos, and it is likewise diversified by ridges of low hills and numerous lakes, whence mountain streams take their origin.

Climate.—The mean heat is perhaps lower than might be expected, and in the less elevated situations thin ice is

common in the winter. At times the power of the sun's rays is very great.

Flora.—The character of the vegetation varies; much is covered by a thin forest of trees, stunted, and crooked in their growth, and struggling among rugged volcanic rocks; and also by large fertile plains, sustaining a varied and abundant flora, through which run clear streams, fringed with trees of very European aspect, and many lively plants. Still there are places extremely barren, and where exposure and the absence of water have excluded all vegetation. There is, however, no want of fertility, and the variety in the climate is favourable to a multitude of fruits and vegetables. The tropical productions of the plains soon cease, and leave the region in the possession of trees, shrubs, and herbaceous plants, whose analogies are with temperate and even cold climates. Quercus has nearly twenty species, which grow through a great variety of elevation, and cease only at about 10,000 feet; one authority says 10,400, and another 9,843 feet. This genus is widely distributed through the continent; to the north we find it with deciduous leaves, on the east coast in 45°, and on the west in 47°; it soon becomes an evergreen, and ascending the mountain sides, does not cease till it has crossed the equator. Recalling that many of its species are found on the Himma-leh mountains, in Java, and other Indian islands, its partiality for low latitudes is very decided. Wheat ceases to be cultivated at the same elevation, and previously rye and barley are mixed with it. Pinus occidentalis is frequent, ranging between 6,100 and 13,000 feet, and as far south as 12° north latitude. There is another species, I believe as yet undescribed, with long cones and longer leaves. It is found around Tepic in the northern part of the region, com-

mencing at 3,500 feet. Other trees and shrubs are supplied by abies hirtella, cupressus thurifera, c. sabinoides, taxodium distichum, taxus montana, alnus mexicana, salix several species, amygdalus microphylla, cheirostemon platanoides, mespilus pubescens, and several species of arbutus, arctostaphylos, vaccinium, rosa, and ribes.

Relations.—With temperate Europe and America it has many genera in common, as senecio, cnicus, draba, ranunculus, anemone, arenaria, stachys, pedicularis, myosotis, polemonium, galium, cornus, and caprifolium; but a firmer connexion with the latter is established through lupinus, ageratum, and chelone; yet nearly every species is peculiar. The more peculiar genera are 'mirabilis, maurandya, leucophyllum, hoitzia, georgina or dahlia, zinnia, sckhuria, ximenesia, lopezia, vauquelinia, choisya, and cheirostemon.' It possesses, in common with other alpine regions, the negative character of having no peculiar natural family, and comparatively few genera; its individuality depends on species. Through quercus and pinus, and some of the herbaceous genera, it is connected more closely with the Himma-leh than with the Andes region.

X.—THE WEST INDIA REGION.

Extent.—The West India Islands, the Bahamas, and the extremity of Florida, south of 27° north latitude, compose this region, which, with the exception of the latter, is the same as Schouw's. It possesses all the vigour and luxuriance of an island climate within the tropics, where moisture is ever ready in the atmosphere to feed vegetation; and the elevation of the surface, which in Cuba

attains nearly 9,000 feet, is also sufficient to produce a variety in the productions. The whole is situated between 10° and 27° north latitude.

Physical Characters.— These islands vary much in their character and geological formation. They admit of a twofold division; the volcanic rising to elevated summits, covered with forest, abundantly supplied with streams of water, and very fertile, as St. Vincent, St. Lucie, Martinique, Dominica, and Guadaloupe; the others, principally composed of limestone, are low, less watered, by no means so productive, and sometimes even sterile, such as Barbadoes, Tobago, Antigua, and Barbuda. Cuba, the most extensive island, is chiefly covered with forest, and has a superficies of 54,000 square miles. A chain of mountains traverses it from east to west, which rises into several peaks, and sends many streams to the plains below. The mountain chain is composed of granite, syenite, gneiss, and mica slate, and the lower lands of secondary formations, and they are eminently fertile and productive. Jamaica has a superficies of 4,256 square miles, and the Blue Mountains, whose greatest elevation is 7,278 feet, make an agreeablo variety in the climate, and a healthy retreat for the invalid. These are chiefly composed of transition rocks, with, nearer the coast, red sandstone, marl, and limestone reposing on them. Some parts are alluvial, and generally well watered and fruitful. St. Domingo has an area of 28,000 square miles, and the central mountain peaks are lofty, La Serrania attaining 9,000 feet, and La Sella, 7,000 feet. Their flanks support noble forests, and are traced by numerous fertilizing streams. Puerto Rico contains 240 square miles, and is equally fertile with the rest. Its highest part is about 4,000 feet, and it has several fertile valleys and plains. The Bahamas comprise a

numerous group, composed of sandstone; and though the soil is generally dry and rocky, they yield some good timber.

Climate.—The temperature is usually equable, but must be called warm; the range is therefore inconsiderable, and the mean at different places will vary from 73° to 81°. It is only on the accession of a north wind, that much deviation occurs, and then even ice is stated to be produced, but those islands most to windward are the greatest sufferers.

Flora.— Originally nearly the whole of this region was covered with forest; a few exceptions might only be found where tropical grasses occupied the surface. Now cultivation has removed an important portion, but extensive woods still exist. Swietenia mahagoni abounds in several islands, as does also guaicum officinale, with various species of myrtus, uvaria, laurus, and melastoma. The sameness these might otherwise produce is broken by several palmæ, and especially by the arborescent ferns, whose peculiar beauty is highly characteristic of the scenery. Ferns are generally very abundant, and assume a tropical variety of stature and habit. The most prevalent and characteristic are asplenium arboreum, cyathæa arborea, c. speciosa, c. muricata, with numerous species of polypodium, pteris, aspidium, gymnogramma, acrostichum, and adiantum. A multitude of twining plants festoon the vegetation, lashing it into an impervious mass, belonging to convolvuluceæ, passifloreæ, some leguminosæ, assisted by interesting kinds of paullinia and aristolochia. Orchidaceæ are very abundant, particularly the extensive genus epidendrum, and species of oncidium, bletia, catasetum, and spiranthes are also numerous.

The claims of Florida south of 27° north latitude to

be considered a part of this region, are established through tillandsia, sapindus, indigofera, chrysobalanus, rhexia, croton, jatropha, and several others.

Relations.—The position of this region between the large continents of America insures an intimate relation with them, modified by its insular situation. This is, however, stronger with South than North America, perhaps arising from the moister atmosphere common to both, for there are no other circumstances which are not equally shared by the Central America region. With the South American regions it is strongly related by similar genera of palmæ, passifloreæ, orchidaceæ, plumbagineæ, cordiaceæ, and arborescent and herbaceous ferns. With the central America region the connexion is through ficus, a few orchidaceæ, asplenium arboreum, swietenia mahagoni, pinus occidentalis, and some others, particularly those of the sandy shores, as hippomane mancinella. There is a singular absence of quercus in the higher lands, considering how very numerous the species are in the Mexico alpine region within the same latitude. It has all the luxuriance of other insular regions within the tropics, and is unsurpassed by them in the variety of its ferns and orchidaceæ, as none others have a similar number for a given space. In the latter, the Pacific islands are much poorer, perhaps from the absence of the dense forest they appear to love. Wydleria portoriccensis and lepidium virginicum, two cruciferous plants, are found on the island, indicated by the specific name of the former.

XI.—THE ORONOCO REGION

Extent.—That vast portion of South America, stretching from the Cordillera of the Andes to the Atlantic, and from the Carribean Sea to the Rio Plata, presents several divisions characterised by certain physical features. From the elevated lands of the interior of the continent three sets of rivers take their origin, and after traversing huge basins, are at length emptied into the ocean in three directions, to the north, the east, and the south. The vegetable productions of the divisions have also their peculiarities, which are sufficiently distinct to authorise a separation; and assuming a designation from the principal river of each, we have the Oronoco Region, the Amazon Region, and the Paraguay Region, the boundaries of which are conveniently traced along the ridges of those secondary mountains, at the bases of which their tributaries have their origin.

The Oronoco Region occupies the northern part of South America, and a line running along the sierra of Araray, and traversing the continent to the Bay of Guayaquil, forms its southern limit; whilst to the north it ceases at the Gulf of St. Michael, and is elsewhere inclosed by the Atlantic and Pacific Oceans.

Physical Characters.—Some lesser ranges of mountains traverse the region, with their sides broken into steep and confined valleys. From their bases extend vast plains or llanos, covered either with forest or luxuriant grasses. These extensive llanos are represented in Brazil by the campos, and around Buenos Ayres by the pampas, but are here in their greatest richness. The rivers often inundate their banks, fertilizing a soil already extremely rich, and for a time

converting large districts into savannah. A very sandy soil prevails in some places, as in the neighbourhood of Cumana, supporting chiefly multitudes of gigantic cacteæ. Humboldt has observed that the vegetation here appeared more luxuriant wherever the limestone was covered by quartzy sandstone, the latter appearing favourable to the retention of moisture.

Climate.—Situated so near the equator, the climate is a warm one. Caraccas has an annual mean of from 70° to 72°, which, however, is far too low for the region, perhaps as much as 8°. The range is stated to be from 51° to 85°, being considerable for the latitude. The humidity of the atmosphere varies according to the soil and vegetation. On the Pacific, in the Bay of Choco, rain falls ten months in the year, but in the more arid parts rain is far from frequent or abundant. The climate of Guiana has been supposed to be favourable to the growth of certain spices, as cloves and nutmegs, which, from some idiosyncracy, are still produced of the best quality only in the Moluccas.

Flora.—Much of the region is covered with forest, particularly in the vicinity of the oceans, between which and the interior a broad belt intervenes. In many instances the trees are remarkable for the beauty of their wood, the fragrance of their secretions, and the rich and valuable resins they exude. In Guiana trees of this character are very numerous, and belong chiefly to Laurineæ. Throughout are spread a vast number of representatives of the tropical arborescent families. Gramineæ abound in the llanos, chiefly of kellingia, cenchrus, and paspalum, intermixed with species of mimosa, turnera, and malvaceæ. On some of the rivers a grass, cynerium saccharoides, attains a height of thirty-two feet. Where the climate is humid, piperaceæ, passifloreæ, and me-

lastomaceæ, are very numerous, overshadowed by the singular clusia and the lofty and fecund bignonia. Filices are numerous as individuals, but, together with orchidaceæ, do not abound in species. Some palmæ are peculiar, and of interest.

Relations.—With the neighbouring regions there are naturally some strong affinities. Rhopala, a proteaceous genus, occurs; and also a species of punica.

XII.—THE ANDES REGION.

Extent.—As ur alpine regions always commence at the line which separates the cultivation of the lowlands from that of the mountains, the lower boundary will be at 6,500 feet, and includes all above this to the confines of the vegetable world at 18,000 feet. It stretches to the northward along the magnificent mountain chains of New Granada, and to the south through Peru and Bolivia, where the line of lowland cultivation will descend a little. Its exact extent to the south has not been acertained.

Physical Characters.—Among the stupendous scenery of the Andes and the steep and scarped precipices and mountain sides, vegetation would appear unlikely to flourish; yet these often afford a shelter, and also assist to collect a soil in the valleys and plains. Hence, from the barrenness of a bare surface of primitive rocks, to the luxuriance of fertile and warm valleys, there is every variety of productiveness. In the plains between parallel ranges the soil is often deep and rich, and is equally suited to agriculture or the rearing of herds of cattle. Mountain torrents descend in fury through deep chasms,

or sometimes assuming, for a while, tranquillity, wander in peaceful and fertilizing streams through the plains.

Climate.—The atmosphere of alpine regions is liable to violent disturbance from storms, which are both rapid in their approach and disappearance, and often leave behind much devastation among the trees of the forest. The temperature of any given spot is very equable, and ranges, for the whole region, from 65° to several degrees below the freezing point. Rain falls throughout the year in frequent showers, with little regard to the seasons, and the amount is no where great. To the decreased pressure, greater brilliancy of the sun's rays, and diminished suspended moisture, some of the peculiarities may be referred.

Flora.—The least elevated portion is occupied by a magnificent forest, and valuable as containing numerous species of cinchona, which yield a medicine highly prized throughout the world, except in the neighbourhood of its production. Some tropical families ascend tenaciously to these elevations, as piperaceæ, melastomaceæ, cacteæ, and passifloreæ, the latter assuming the novel habit of arborescence; and the numerous synanthereæ are particularly characteristic. Ficus, oreocallis, clusia, persea, and ocotea, are mingled with podocarpus, quercus, ilex, and salix. Above the forest is a large district of bushes with much variety in the species; drymis and wintera from the south, meet ribes, rubus, and viburnum from the north, and are associated with various species of thibaudia, alnus, andromeda, fuchsia, vaccinium, calceolaria, culcitium, duranta, barnardesia, escallonia, berberis, and befaria. The flora is agreeably diversified by some hæmanthus, alstrœmeria, sisyrinchium, and other liliaceous plants. The grasses, which, in both a botanical and economical point of view, are so important, occupy a broad space between 13,000

and 14,500 feet, and are contributed chiefly by jurava, stipa, agrostis, panicum, avena, and dactylis. Succeeding to the grasses are many herbaceous plants, and lastly the lichens, crowning, as it were, the flora of the region. Even this very slight sketch would be incomplete without mentioning some of the groups which flourish on the higher elevations and give an aspect of variety. A few of these are herbaceous compositæ, lowly umbelliferæ, saxifrageæ, cruciferæ, valeriancæ, and caryophylleæ; with species of gentiana, rumex, plantago, arum, oxalis, dorstenia, swertia, and lobelia. The plants attaining the greatest elevation are two lichens, umbilicaria pustulata and verrucaria geographica.

Relations.—Between all alpine regions there will be numerous analogies, but few points of identity, and also a certain similarity with regions of the lowlands in a proportionate latitude. With the Mexico alpine region are several sources of resemblance through ericaceæ, synantheræ, cruciferæ, quercus, salix, and cheirostemon platanoides. It however is deficient in the important genera of pinus, abies, and rosa. The flora is so rich and varied, that relations may easily be traced with most regions under a temperate climate.

XIII. THE AMAZON REGION.

Extent.—This extensive region occupies a chief part of the empire of Brazil, and comprises the richest and finest portion of South America. It consists of a magnificent basin intersected by a multitude of rivers, many of which are of considerable size. The original streams of the largest of these, the Amazon, have their rise in the Andes, and gradually uniting their waters, traverse the region to the Atlantic ocean. Its boundaries are the

ridges of the mountain chains, which may be regarded as the margins of the basin, and cannot be traced with accuracy. From east to west it extends from the Atlantic to the Cordilleras, on the north it has a sinuous outline on the summits of the Sierra de Araray and the Parimé chain to the bay of Guayaquil; and on the south between the provinces of Minas Geraes and San Paulo, bending to the head waters of the Paraguay onward to the Andes in Bolivia.

Physical Characters.—From the Andes, plains of almost boundless extent gradually incline towards the Atlantic. Several ranges of low mountains intersect them, but their comparative importance is trifling, and their elevation rarely exceeds 4,000, never 6,000 feet; which is insufficient to produce any material change in the vegetation, though permitting some plants to adopt a selection. Balbi regards these plains as table lands, with an elevation from 1,030 to 1,660 feet. Granite and syenite form the bases of both the mountain chains and the lowlands, on which repose gneiss, mica slate, chlorite slate, quartz rock, and limestone. On these again are sandstone and slate clay, with alluvial deposits. True volcanic rocks have no existence. The soil varies; in the forest it is either a rich dark vegetable mould, or a fruitful deep red loam, and both are astonishingly productive under cultivation. In the more open country sand enters largely into the soil, and when opposed to a moist as well as warm atmosphere, displays a varied vegetation. The soil in the neighbourhood of the rivers has, from their periodical inundations, attained the greatest fertility, and gives birth to an excess of luxuriance.

Climate.—The equator traverses the region, but the climate partakes of that unsteady character with regard to humidity which is so frequent, and at the same time so

productive of variety. Para will give us the state of the climate on the plains nearest the river. The atmosphere is hot and sultry, and the range of temperature throughout the year very small; the mean is 84°, and the annual fall of rain from 80 to 100 inches. More to the south, the year is regularly distributed into the wet and dry seasons. At Rio Janeiro the rains occur from September to March, the temperature high, and often with much electrical disturbance of the atmosphere. In the interior of the country rain is less abundant, and in some places scarce. The seasons are the reverse of those in the neighbouring Oronoco regions.

Flora.—In this region the American tropical families are in excess, and have the greatest number of representatives. The vegetation has a twofold character, comprising the forest, which extends in a broad belt along the coast from north to south, and the Sertam country, a contraction of dezertam, where grasses and shrubs prevail, and occasionally a few trees in sheltered valleys or ravines.

The forest is composed of an endless number of trees, of which to mention some would be placing others too much in the background. These trees attain a great height, with straight clear stems, their foliage uniting in a canopy above, and leaving all beneath in perfect shade and quiet. This great longitudinal developement is not favourable to a protracted existence, as age and climate soon attack the trees, and their places are left vacant for others. Of the natural families which abound in greatest intensity, and are also conspicuous for their interest, are, palmæ, assuming much variety of habit, cinchonaceæ, melastomaceæ, piperaceæ, myrtaceæ, maregraaviaceæ, gesnericæ, sapindaceæ, vochyaceæ, guttiferæ, malpighiaceæ, hippocrateaceæ, and bromeliaceæ. Epiphytic plants festoon the trees in multitudes, but here orchi-

daceæ are not frequent, and their place is supplied by species of bromelia, tillandsia, the strange pothos, and many ferns. The twining plants are freely supplied by passifloreæ, leguminosæ, convolvulaceæ, aristolochiæ, asclepiadeæ, and mikania.

The Sertam country has its own vegetable charms, and though much occupied by grasses with a dull grey hairy surface, has large spaces covered with bushwood, and sometimes even trees. Many of these are attractive, and chiefly belong to cinchonaceæ, compositæ, apocyneæ, malpighiaceæ, and euphorbiaceæ. A few of the more numerous genera are declieuxia, rhexia, banisteria, gaudichaudia, croton, wedelia, kleinia, and sauvagesia. The trees are described by Von Martius as attaining only fifteen or twenty feet in height, and growing as a light open grove. The chief are derived from laplacia, gomphia, maregraafia, vochysia, qualia, solanum, byrsonima, erythroxylon, panax, and rhexia; and amaryllideæ are frequent.

Some peculiarities may be noticed on the sides and summits of the different mountain chains. On Itacolumi, or the Child of Stone, a mountain near Villa Rica, attaining 5,710, Von Martius saw the curious arborescent lilies of barbacennia bicolor, b. tricolor, b. tomentosa, b. luzulæfolia, b. ensifolia, vellosia abietina, and v. taxifolia. Other characterizing genera are galium, morinda, declieuxia, oxypetalum, ditassa, lisianthus, exagum, phyllanthus, lavradia, gloxinia, gesneria, vitis, and ternstroemia. Growing on the ironstone floetz formation, and supposed to be distinctive of it, were, laurus erythropus, bauhinia ferruginosa, abatia tomentosa, brysonima nitidissima, banisteria versicolor, vanillosma firmum, lisianthus pulcherrimus, phyllanthus robustus, and mikania glauca. The swampy ground is distinguished by species

of hydrocotyle, drosera, andromeda, gaultheria, utricularia, sauvagesia, and eriocaulon.

Relations.—Among the alpine plants, if so they can be called, are many intimately connected with the vegetation of the temperate regions of Europe and North America, as panax, clethra, vitis, galium, and gaultheria. Ambrosia artemesiæfolia, a strand plant of the Iroquois Region, occurs on the shores of Paraiba. Walsh saw patches of the European fern, aspidium filix mas, and also bushes of Rubus occidentalis. The same traveller mentions avena sterilis attaining a height of ten feet. For some time the existence of canna indica was supposed to confer an interesting point of identity with India, but it is now known to be a frequent plant within the tropics.

XIV.—THE PARAGUAY REGION.

Extent.—It embraces the space of country traversed by the Paraguay River and its tributary streams; its outline will thus extend from the coast between the Brazilian provinces of San Paulo and Minas Garaes, and, arching to the north, terminate on the limits of the Pampas Region, and again on the south along the course of the Rio Plata, and the hitherto unascertained margin of the same region.

Physical Characters.—A portion of this country is not so completely a plain as would appear from the maps, as towards the Andes several spurs are sent off which spread into the interior. San Paulo is sufficiently elevated to affect considerably its productions, and the difference between it and Minas Geraes has struck several travellers. Generally the soil is rich and fertile,

but there are large spaces covered with scarcely anything but sand, and yielding a poor bushy vegetation.

Climate.—That of San Paulo corresponds to the whole region; the mean temperature of the year is 73°, and the range is small. Hoar frost is sometimes seen, but snow is unknown. The rains occur at two periods, the autumnal being the heaviest.

Flora.—The tropical features, which the Amazon Region possesses in such intensity, have greatly diminished; palmæ are few; ferns continue very numerous, but with a habit more suited to a drier climate. Baccharis and other compositæ cover the sandy districts, and cacteæ are frequent. Umbelliferæ, though far from numerous, have a greater preponderance than in neighbouring regions. The forest is open, and composed of fine trees; arborescent ferns still continue, and where they assemble in groves exclude all other vegetation, a peculiarity possessed by them when growing gregariously. In a collection of plants made in the warmer portion of the region, compositæ were a 12th, leguminosæ a 15th, cinchonaceæ and orchideæ a 20th, melastomaceæ a 29th, labiatæ and solaneæ a 40th.

Tristan da Cunha, situated in 37° S. lat., is known to possess 113 indigenous plants, among which are several umbelliferæ, which induces us to regard the island as a fragment of this region.

Relations.—These are perhaps feeble with distant regions, whilst they are not strong with those in the vicinity. Araucaria brasiliensis is frequent in the forest, a representative of an Australian genus, though having a nearly allied species in Chili.

XV.—THE CHILI AND PERU REGION.

Extent.—A peculiar and well-defined region, but still far from productive. It includes a narrow strip between the Cordilleras and the Pacific Ocean from Cape Blanco in 4° S. lat. to the oblique line stretching from 36° S. lat. on the coast of Chili to Port St. Antonio on the opposite side. Both limits are well marked; at the northern the forest of the adjacent region commences suddenly, and at the southern, around Conception, rapidly appear those numerous genera, which establish so strong a relation between the Patagonia Region and the temperate latitudes of the northern hemisphere. Some doubts may arise whether the Andes of its southern part should not be included, and I am disposed to think they ought, but at present it is impossible to trace the exact relations. The two islands of Juan Fernandez also belong here.

Physical Characters.—The flank of the Cordilleras regarding the Pacific is composed chiefly of porphyritic rocks, but the somewhat inclined plane which slopes towards the ocean is formed by deposits of clay, both tertiary and recent, very frequently inclosing shells, and resting on a substratum of brown sandstone. The surface may be divided into the valleys and the intervening ridges; the former containing some soil, and a supply of water near which is assembled the entire vegetation, whilst the spaces between are usually quite bare, or only support some straggling brushwood. The soil in the exposed places contains a large proportion of salt, both of nitrate of potash and chloride of sodium, which lies in a thin stratum one or two inches beneath the surface and can be easily removed in solid thin cakes. This

admixture renders the soil very puffy, and after being moistened by the heavy dews it forms a thin brittle crust. It also deprives it of the customary cohesion, and wherever the soil has collected, as on the sides of the hills and valleys, the foot readily sinks six or eight inches.

Climate.—Though much is within the tropics, it has few corresponding features. The temperature of the intertropical part is warm during the dry season, but is unusually cold and chilly at the opposite period; it has thus a great range. Rain is a novelty almost throughout, and instead there are dense falling mists, called garuas, from May to August, which render the weather particularly unpleasant. In the northern part these cease with great suddenness, for in the Bay of Guayaquil the rains are very heavy, and at Tumbez, within half a degree, a shower is not seen for years together. To the south the two are gradually shaded off into each other, and at Valparaiso the rainy season is short and less regular, whilst at times there is something like the garuas. The absence of regular rain has been attributed to the south wind, which blows with much constancy; and it has been observed that during the season of mists a light breeze from the opposite quarter is not unfrequent. At Valparaiso the temperature is more in accordance with its geographical position; it is situated in 33° S. lat., and during June and July, the two most unfavourable months, the range was from 46° to 64° the dews extremely heavy, but rain fell latterly.

Flora.—Nothing that can be called forest exists, a few trees only being scattered sparingly about, and though much is within the tropic, corresponding characters are not strong. Cocos chilensis has a few individuals scattered about the valleys in the neighbourhood of Val-

paraiso, and the potato may be seen here growing wild on some of the hills; a species of bambusa is not uncommon, and a salix is frequent in the valleys. The chief tree is cordia decandra, but many spots are not deficient in cultivated fruit trees. The plants recalling tropical features are azara serrata, krameria cistoidea, coriaria ruscifolia, cassia sp., mimosa cavenia, loasa acerifolia, amirola glandulosa, and croton lanceolatus. Cereus, opuntia, euphorbia, lobelia, calceolaria, and oxalis, are common. About Valparaiso are low thickets of shrubby compositæ; and amaryllideæ and irideæ are numerous. On waste ground near Lima tropæolum majus abounds, with sida, datura, cestrum, alternanthera, œnothera, asclepias, and calceolaria. In a few favoured valleys the ground is quite yellow with the multitudes of flowers of pancratium amencaes, whose expanding flowers are the signal for the commencement of the revels bearing its name.

Relations.—The most interesting will be with the California Region, with which there is much similarity in climate, and some in productions through ageratum, mimulus, castilleja, rhus, ribes, berberis, and laurus. The prevalence of bulbous plants in Chili confers some resemblance with the South Africa Region.

XVI.—THE PAMPAS REGION.

Extent.—That portion of South America between the Andes and the mouth of the Rio Plata is composed entirely of this peculiar district. To the north it extends to the neighbourhood of the towns of the interior, and approaches the river Paraguay; its exact outline is here imperfectly known. To the south it terminates in an

oblique line, extending from the Port of San Antonio to 36° S. latitude on the west coast.

Physical Characters.—A vast plain stretches on all sides, very slightly raised above the level of the sea, and only diversified in a few places by low hills. Some unimportant rivers have their origin, and are often again lost in the soil. Reddish marl is mentioned as occurring, but is not perhaps general. To the south the soil is impregnated with saline matter.

Climate.—The seasons are temperate, and their alternations produce a rapid change in the vegetation.

Flora.—The remarks of Sir Francis Head on the features are appropriate. "The great plain of Pampas of the Cordillera is about 900 miles broad, and the part which I have visited, though in the same latitude, is divided into regions of different climate and produce. On leaving Buenos Ayres, the first of these regions is covered, for 180 miles with clover and thistles; the second, which extends for 430 miles, produces long grass; and the third region, which reaches the base of the Cordillera, is a grove of low trees and shrubs. The second and third of these regions have nearly the same appearance throughout the year; for the trees and shrubs are evergreens; and the immense plain of grass only changes its colour from green to brown; but the first region varies with the four seasons of the year, in a most extraordinary manner. In winter, the leaves of the thistles are large and luxuriant, and the whole appearance of the country has the rough appearance of a turnip field. The clover, at this season, is extremely rich and strong; and the sight of the wild cattle, grazing at full liberty in such pasture, is beautiful. In spring, the clover has vanished, the foliage of the thistle has extended across the ground, and the country still looks as if covered with a rough crop of turnips. In

less than a month the change is most extraordinary; the whole region becomes luxuriant with enormous thistles, which have suddenly shot up to a height of ten or eleven feet, and are in full bloom. * * * The summer is not over before the scene undergoes another change; the thistles suddenly loose their sap and verdure; their heads droop, the leaves shrink and fade, the stems become black and dead, and they remain rattling with the breeze one against another, until the violence of the pampero or hurricane levels them with the ground, where they rapidly decompose and disappear; the clover rushes up, and the scene is again verdant." Ranunculaceæ, caryophylleæ, and cruciferæ, make their appearance, and the low bushes are most probably chiefly compositæ. Species of lathyrus, polygala, anemone, oxalis, lobelia, galium, plantago, and teucrium, are also frequent.

Relations.—There is a strong connexion with some of the European Regions through numerous genera, and some slight alliance with the South Africa Region. It is curious that an exotic thistle, cynara cardunculus, should have taken such entire possession of a large district, as to have obliterated nearly the whole of the spontaneous vegetation. Its luxuriance is so great, that the question arises, whether plants can ever find a situation more favourable to their existence than that in which nature has placed them? The excessive developement also of psidium pomiferum, at Tahiti, would seem to require an affirmative. In general character there is some similarity with the Prairie Region, but the minuter features are different, and the latter is less fertile.

XVII.—THE PATAGONIA REGION.

Extent.—In the vicinity of Conception, a change takes place in the character of the vegetation, and in the climate; trees commence, and heavy rains are exchanged for the peculiar climate of Chili and Peru. An imaginary line, commencing on the west coast, in 36° S. latitude, and extending obliquely to Port San Antonio, on the opposite side, separates the southern extremity of the continent, and with the adjacent islands constitutes the region.

Physical Characters.—The Andes have now lost their stupendous size, and are continued as an inferior mountain range, of an average elevation of 3,000 feet, rarely or never attaining 6,000 feet, and their appearance is wild, bleak, and desolate. Primitive rocks abound, and granite greatly prevails; towards the Straits of Magellan are various hornblendes and slates, and the latter appear favourable to vegetation, for fagus antarctica attains on it a great size, whilst a reddish sandstone is barren.

Climate.—Moist and unfriendly for the latitude; the number of rainy days is very great, and a thoroughly fine one is rather a novelty. Though the temperature is not in extremes, still the summer months are chilly. For the month of May, in the vicinity of Cape Horn, the mean temperature was 40°, the range from 30 to 48°, and very equable through the day and night; the fall of rain eight inches; dew-point 2° or 3° below the atmosphere, the greatest being 7° or 8°; hail frequent, with the temperature from 42° to 48°. About Conception the climate is more agreeable, the temperature warmer, and the rain falls at regular seasons.

Flora.—Irregular groups of wood cover the surface, wherever the climate is moderate, and there is a mitigation of its general austerity. The chief trees are assembled about Conception, and somewhat to the south is the principal station of auraucaria imbricata. Among these are fagus obliqua, laurus lingui, laurelia aromatica, drymis chilensis, quadria heterophylla. At Tierra del Fuego and Staten Land, fagus antarctica, an evergreen species, is frequent, and, assisted by others of a similar habit, gives a peculiar character to the scenery. Forster, the companion of Cook, has described with some quaintness the general features. "In the cavities and crevices of the huge piles of rocks, forming Tierra del Fuego and Staten Land, so very like each other, where a little moisture is preserved by its situation, and where, from the continued friction of the loose pieces of rocks, washed and hurried down the steep sides of the rocky masses, a few minute particles form a kind of sand; there, in the stagnant water, gradually spring up a few algaceous plants from seeds carried thither on the feet, plumage, and bills of birds; these plants form at the end of each season a few atoms of mould which yearly increases; the birds, the sea, or the wind carries from a neighbouring isle, the seeds of some of the mossy plants to this little mould, and they vegetate in it during the proper seasons. Though these plants are not absolute mosses, they are, however, nearly related to them in their habit. We reckon among them the ixia pumila, a new plant which we call donatia, a small melanthium, a minute oxalis and calendula, another little dioicous plant, called by us phyllachne, together with the mniarum. These plants, or the greater part of them, have a peculiar growth, particularly adapted to these regions, and fit for forming soil and mould on barren rocks. In proportion as they grow

up, they spread into various stems and branches, which lie as closely together as possible; they spread new seeds, and at last a large spot is covered; the lowermost fibres, roots, stalks, and leaves, gradually decay and push forth on the top new verdant leaves; the decaying lower parts form a kind of peat or turf, which gradually changes into mould and soil. The close texture of these plants hinders the moisture below from evaporating, and thus furnishes nutriment to the vegetation above, and clothes at last whole hills and isles with a constant verdure. Among the pumilous plants some of a greater stature begin to thrive, without in the least prejudicing the growth of these creators of mould and soil. Among these plants we reckon a small arbutus, a diminutive myrtle, a little dandelion, a small creeping crassula, the common pinguicula alpina, a yellow variety of viola palustris, statice armeria or sea-pink, a kind of burnet, the ranunculus lapponicus, the holcus odoratus, the common celery, (apium australe,) with the arabis heterophylla. Soon after we observed, in places which are still covered with the above-mentioned, a new rush, (juncus triglumis,) a fine amellus, a most beautiful scarlet chelone, (C. ruelloides,) and lastly even shrubby plants, viz. a scarlet-flowered shrubby plant of a new genus, which we called embothrium coccineum, two new kinds of berberry, (berberis ilicifolia, b. mitior,) an arbutus with cuspidate leaves, (A. mucronata,) and lastly the tree bearing the winter's bark, (drymis winteri,) which, however, in these rocky barren parts of Tierra del Fuego never exceeds the size of a tolerable shrub; whereas in Success Bay, on a gentle sloping ground, in a rich and deep soil, it grows to the size of the largest timber." Many of Forster's new names have now become as fa-

miliar as household words to the botanist. Mosses and lichens abound here, but ferns are scarce.

The flora of the *Falkland Islands* is scanty, being composed chiefly of a few compositæ, gramineæ, lichens, and musci. Bolax glebaria is found here, and veronica decussata as a shrub six feet high, but not fit for firewood, the deficiency of which is met by peat, which, Weddel says, is abundant.

The *South Shetlands* have only some straggling grass and a lichen.

Relations.—The relations are stronger with the temperate regions of the northern hemisphere than with those in its vicinity. With the former it has a number of genera in common, as, omitting those already mentioned, betula, ribes, rubus, andromeda, vaccinium, auricula, cardamine, draba, lepidium, stellaria, hydrocotyle, anemone, drosera, galium, tussilago, salix, carex, cyperus, and usnea. With adjoining regions, fuchsia, myrtus, drymis, baccharis, escallonia, calceolaria, and chelone. With the South Africa Region, nothwithstanding a considerable difference in the climate, gladiolus, ixia, wistenia, galaxia, and crassula. And with New Holland, araucaria, embothrium, ourisia, and mniarum. Its own peculiarities are due to the novelty of nearly the whole of the species, and to the genera gaimardia, astelia, callixene, philesia, drapetes, bæa, pernettia, oligosporus, nassavia, bolax, azorella, donatia, acæna, hamadryas, and the curious misodendrum. A relation of identity with European regions is established through pinguicula alpina, viola palustris, statice armeria, dactylis glomerata, and several mosses and lichens.

XVIII.—THE POLYNESIA REGION.

Extent.—The various groups of islands composing this region have no great superficies, but possess many features of peculiarity and interest. The region by no means includes all the group of the Pacific Ocean, but only those which are more particularly designated as Polynesia. It comprises the Sandwich Islands, the Society Islands, the Marquesas Islands, the Gambier Islands, the Harvey Islands, the low coral islands of the Dangerous or Pomoutou group, and the Radack and Ralick chains, with a few solitary detached, but unimportant islands.

Physical Characters.—There are perhaps few spots where such an assemblage of agreeable external circumstances is met with, and where the visitor is assailed by so many favourable impressions. The climate is warm without being oppressive, the scenery partakes of all that variety nature can so well assume, where mountain, valley, and plain exist, and have each their charms; and where the vegetation is varied and agreeable, without being in excess. The islands may be regarded as so many mountains of basalt and lava, split by numerous valleys, and with their bases often dilated into plains, stretching with various inclinations to the cliffs or coral reefs of the shores. The valleys are usually very steep, and contain the chief and richest soil, for the mountains often display precipices with the smoothness and regularity of artificial walls. Elsewhere are numerous projecting masses of rocks, rendering certain parts entirely unfit for cultivation. Among the denser vegetation the soil is black from the mixture of organic matter, but on the plains it is frequently of a deep-red colour, and may be used as a coarse paint. This owes much of its exist-

ence to the decomposition of the lava rock, and is very productive when supplied with abundance of water. The coral islands must be excepted from the above, as they have a low flat circular surface, with small patches of vegetable mould.

Climate.—Within the influence of the trade-winds, and ever fanned by their breezes, the temperature of the region is not high for the latitude. It is something greater at the Society Islands to the south of the equator, than at the Sandwich Islands to the north. At Honolulu, Sandwich Islands, Mr. Rooke's Observations for 1838, give the mean temperature as 77° 3, fall of rain 21·1 inches, fine days 285, rainy 37, variable 43. Similar observations at the Society Islands are wanting. The quantity of rain in different places varies greatly; and in the interior, near the highest land, the amount will be three or four times more than the above; and places to windward will have less than others to leeward. From some observations, I am disposed to fix 193 feet of ascent as equal to one degree of the thermometer. The seasons at the two sides of the equator will be at different periods, and rains occur a little after the summer solstice. At the Marquesas I found some relative temperatures to be, under the shade of vegetation 86° 5, the soil 80°, the sun's rays partially obscured, 103°.

Flora.—The vegetation is not rich but interesting; indeed it may be called a poor flora. Forest cannot be said to exist; and the trees crowd up the valleys and less perpendicular ascents, with more the character of groves. Irregular patches of these diversify the aspect of the country, the intervals being filled with smaller vegetation. Dracæna terminalis spreads over the valleys; and the troublesome grass, centrotheca lappacea, covers every dry spot on the ridges and sides of the hills, and even of

the plains. The trees are not large but numerous, and want the great height attained in the genuine forest. The vegetation is otherwise peculiar, from its small and inconspicuous flowers, being deficient in size and richness of colour, the absence of fragrant properties to a great extent, and the leaves being mostly small, undivided, and of a dull shade of colour.

I have thought that there were proofs here of plants degenerating towards the margins of the extent of their indigenous existence. Artocarpus incisa, broussonetia papyrifera, and aleurites triloba, grow nearly everywhere spontaneously. At the Society Islands they thrive vigorously, as large trees; but on advancing eastward they gradually diminish in size and vigour till, in the Gambier group, they are hardly of any use to the natives; and in Easter Island, where the two latter are found, they are low and useless bushes. The same circumstance may be noticed with the shells, cardium cardissa, terebra maculata, conus betulinus, purpura persica, and perhaps others.

The Sandwich Islands have a superficies of 6,600 square miles. The prevailing families are, filices, very numerous; a large proportion of compositæ, cinchonaceæ, leguminosæ, malvaceæ, cyrtandraceæ, labiatæ, urticeæ, euphorbiaceæ, piperaceæ, and gramineæ. The vegetation is more closely distinguished by several araliaceæ, goodenoviæ, lobeliaceæ, amarantaceæ, and pandaneæ; whilst the presence of cruciferæ, saxifrageæ, and umbelliferæ, invests it with further peculiarities. Till recently no palm beyond the cocoa-nut was supposed to exist, but a species of chamærops has been discovered. Orchidaceæ have no existence. The peculiar genera are few, kadua, charpentiera, dubautia, and a few others. In Hawaii, Mouna Roa reaches 15,980 feet, and Mouna Koa 13,500 feet, and

have a vegetation with alpine features. Vaccinium, rubus, and fragaria are found here; and when the flora shall be better known, a small alpine region will most probably become necessary.

The Society Islands. These islands have a much smaller superficies, and a flora of only 500 species. They contain nearly the whole of the different species of the region south of the equator; and there are very few not found at Tahiti, the largest of the group. The prevailing families of the Sandwich Islands exist equally here, the chief peculiarities depending on the presence of several cruciferæ, on the comparative abundance of cinchonaceæ, euphorbiaceæ, and urticeæ, the scarcity of leguminosæ, and through celtis discolor in possessing ulmaceæ.

The Marquesas yield nothing in natural beauty to the other islands, and have a flora hitherto very sparingly examined, but apparently identical with that of the Society Islands, though even less abundant. The self-introduced plants which fringe the shores are different from those of the same class at the Sandwich Islands, and evidently come from that part of the coast of America nearest at hand. Some species monopolize a large surface. Hibiscus tiliaceus runs far into the valleys, to the exclusion of everything else; desmodium purpureum occupies the waste ground near the sea; and centrotheca lappacea spreads higher upon the hills. The bread-fruit and cocoa-nut compose large groves.

The Harvey Islands have a vegetation identical with the Society Islands. Rarotonga has the reputation of being the most picturesque island of the Pacific. It is very productive; and the paramount object of the residents at present is to exclude the guava-bush, which at Tahiti has spread so widely, obliterated the grass, and much other of the vegetation.

The Gambier Islands are volcanic islands set in coral reefs. The flora is the same as at the Society Islands. Metrosideros obovata has hitherto only been met with here.

The Pomoutou Islands. These irregular coral islands are upwards of fifty in number. Their surface is composed of ragged fragments of dead coral, with a little vegetable mould in places; and sometimes water is found a few inches beneath the surface. The flora is extremely limited, and, it must be inferred, in no respect original; yet there are one or two plants at present not known to exist elsewhere. A collection of plants made by myself, with a few additions from other sources, gives a total amount of 47 species, which are referable to 40 genera, and 27 families. Lepidium piscidium disregards the heat, and appears wherever there is a little soil, and the parasitic cassythis filiformis mats together the bushes.

The Radack and Ralick Chains, though closely resembling the latter, are more productive, and cultivation is practised. Chamisso mentions 52 species, many of which are indigenous at the Sandwich Islands and Guahon. He also observes that the southern islands have a richer soil and older vegetation.

Relations.—The existence of this region, as a whole, is very clearly defined; the connexions with the nearest regions not being very intimate. Its relations are spread far and wide. In the Sandwich Islands there are affinities with New Holland through metrosideros, myoporum, exocarpus, cyathodes, and an aphyllous acacia; with Europe are several jungermannia, and musci in common; besides, with North America and Asia, several identical species. In the Society Islands the affinities are strongest with New Holland through metrosideros, myoporum, casuarina, and dodonæa; but they have no representative

of epacrideæ, as at the Sandwich Islands. From these latter they are further distinguished by the presence of ficus and several orchidaceæ. With South America and Asia there are some relations, but they are not striking. Rhizophora has no existence.

XIX. THE PAPUA OR NEW GUINEA REGION.

Extent.—Several large and important islands, of which New Guinea is by far the most extensive, lying between the equator and 23° south latitude. Commencing at the western extremity, the region includes the Moluccas, Papua or New Guinea, the former designation being the most in use in the surrounding seas, the Admiralty Islands, New Britain, and New Ireland, the Solomon Islands, New Hebrides, New Caledonia, the Feejee Islands, Tonga archipelago, and Navigator's Islands.

Physical Characters.—The scenery is bold and rugged, particularly about the Solomon group, and many of the islands are nothing but mountains. The forest, which abounds everywhere, rests on rocky declivities, with very little soil. In Papua and the Feejee Islands, there are extensive level surfaces of rich soil, apparently the deposit of rivers. There are several active volcanos, and much of the structure is in every probability volcanic. Conglomerate, limestone, and stratified sandstone occur in Papua. The islands of the Tonga group are curious flat tables of limestone, forty feet and upwards above the level of the sea, and with deep water close to their wall-like cliffs. The elevation of the mountains of Papua is undoubtedly not so great as has been supposed, and along the whole extent of its northern

shore none are visible which at all approach the limit of perpetual snows.

Climate.—Heat and moisture prevail, and render the climate a warm, and from the productions, it is likely, a peculiar one. An anomaly exists in the distribution of the seasons. It is customary for the south-east monsoon to bring the dry season to the space over which it blows from May to October inclusive. The north-west monsoon prevails for the remaining months of the year and accompanies the rains. The reverse happens over the extent of this region, for though the monsoons are not so powerfully felt at its eastern extremity, the climate is everywhere the same. In the south-east monsoon the rains are heavy and frequent, and the deposition must be very considerable.

Flora.—Approaching this region from the eastward, the character of the flora as distinct from the Polynesian is very evident; palmæ become more numerous through chamærops, caryota, and areca; pandanus has many species; leguminosæ, though more abundant than in the Polynesia Region, and compositæ are not frequent, a proof of the usually moist state of the atmosphere; cycas first appears at New Ireland, and rhizophora in the rivers of the Feejees. However, it is a flora, with the exception of the Moluccas, almost unknown.

Papua or New Guinea.—Forest covers everywhere this large and fine, but unhealthy, island, and presents a variety which perhaps makes it the most prolific of vegetable forms in the world. The vegetation is extremely varied, and the species appear to have a limited range. Here, as elsewhere, it is chiefly on the margins of the forest, that flowers and herbaceous plants are seen. The colours are generally little attractive, and white greatly prevails. This is partly compensated by

the frequent fragrance of the flowers, and sometimes even of the foliage. Leguminosæ, solaneæ, and umbelliferæ, are uncommon. Trees of achras and myristica are numerous in the forest, and there are several species of each. The nutmegs are without the aroma found in myristica moschata. This genus extends as far to the east as the Feejee Islands. Ferns of every variety of habit are most numerous, and orchidaceæ abound.

The Moluccas have a less compact forest, as open spaces of bushes often occur, but a great variety in its trees. They are remarkable, as the native country of the clove and nutmeg of commerce, and of other aromatic productions.

Relations. — When the southern shores of New Guinea are better known, there will most probably be discovered many sources of resemblance with New Holland. At present the most prominent are, casuarina, common throughout the region, melaleuca and eucalyptus in the Moluccas, and acacia laurifolia, an aphyllous species, in the eastern groups. A passiflora is common in the Feejee and Navigators' Islands. Agathis appears in the Moluccas, as well as in New Zealand, and the resin is largely used, under the name of dammar, to give light.

XX.—THE AUSTRALIA TROPIC REGION.

Extent.—The space between the northern shores of New Holland and the limit of the tropic in 23°28′ south latitude. The genuine characters of this region are lost, even within this limit, towards the west coast, where at Point Leveque in 123° east longitude, it meets the west Australian region.

Physical Characters.—Little is known respecting it, the coast only having received a partial examination. The shores are generally low and sandy, often barren, but sometimes clothed with a rich and luxuriant vegetation.

Climate.—Tropical in temperature, but deficient in the usual amount of suspended moisture.

Flora.—The thin forest of New Holland prevails, but partakes more of the usual tropical characters, and in some places is so dense and vigorous as to be almost impenetrable. In the vicinity of Van Diemen's Gulf species of eucalyptus, corypha, pandanus, acacia, and croton, form a thick vegetation. The shores are closely beset by rhizophora, brugiera, and carallia, all genera of rhizophoreæ. Palmæ are not numerous, and are represented by corypha, seaforthia, livingstonia, and calamus. Leguminosæ, as might be expected in such a climate, are very abundant; also euphorbiaceæ through croton and phyllanthus; and coniferæ are present in podocarpus, callitris, and araucaria. A. excelsa is not here a large tree, but occasionally covers much space. Cinchonaceæ do not abound, and such as exist have Indian relations. Bignoniaceæ have a few species. Cryptogamic plants, epiphytic orchidaceæ, and others with similar habits, and depending less on their roots for food than on the atmosphere, are all infrequent. Loranthus, embracing as it does genuine parisites, is frequent on all the coasts of New Holland.

Those plants so entirely characteristic of this continent, and which are developed so profusely in the metropolis of their existence, are still spread among the vegetation, but in reduced numbers. Proteaceæ are nearly limited to grevillea, hakea, and persoonia; the Australian myrtaceæ are few; diosmeæ has only eriostemon and phe-

balium; eucalyptus has few species and individuals, and diminished vigour; casuarina is gradually disappearing.

Relations.—Mr. Allan Cunningham has had the best opportunities of examining the vegetation. In an expedition directed to this part of the coast he collected 1500 species of phenogamous plants, of which 520 had been previously described. In a comparison between the east and north-west coasts in the parallel of 15°, and with an intervening space of 1,800 miles, he found only forty-eight species in common. He also gives a list of fifty-two Indian and South American plants, which are indigenous to Australia. (King's voyages, Appendix.) Umbelliferæ have a few species, and there are some close relations with the flora of New Guinea and the Malay Islands. Among others, myristica is not uncommon on the northern and north-western coast.

XXI.—THE NEW SOUTH WALES REGION.

Extent.—The British colony of New South Wales occupies a large portion of the east coast of New Holland. Our region is, however, more rigorously defined, and will comprise the east portion of the continent south of the tropic, and ceases to the west and south somewhere in the neighbourhood of the mouth of the Morumbridgee.

Physical Characters. — The whole continent has been divided into two parts, the region of terraces, and the region of plains, separated by the 148th meridian. Captain Sturt observes, that of the ridges which divide the latter, each presents a different rock formation, and also that he has noticed that the botanical and geological features are intimately connected. The Blue Mountains

attain no considerable elevation, scarcely exceeding 3,000 feet, and form a wild and sterile barrier between two portions of the country. The soil varies, much is extremely arid, and some is productive on slight cultivation. It is probably a variety which will soon wear out, and large tracts are required for grazing purposes. The kind of trees growing are regarded as a good indication of the quality of the soil; the native apple (Angophora lanceolata) selecting a good soil, and the spotted gum and stringy bark a bad. Rhagodia, salsola, and similar plants, are met with in places, and indicate a saline soil. After the wet season, ephemeral rivers traverse the country, and lose themselves either in sandy plains or chains of marshy ponds. At other seasons much of the surface is indifferently watered.

Climate.—There is a great disposition to excess both in temperature and in dryness. The range of the thermometer is sometimes very great and sudden, being in the summer months from 36° to 106°, the mean 70°; and in the winter months from 27° to 98°, the mean 66.° At Sidney the number of rainy days is 107. There is evidently a strong adaptation of the vegetation to the climate and other physical agents.

Flora.—It has been observed by many, that in the Australian vegetation there is a sombre dulness which entirely excludes any of those lively and agreeable impressions it elsewhere so frequently creates. The forest, where it abounds, is not close and compact, but so open as to offer no obstruction to the passenger, and intervals are frequently occupied by dry stunted bushes, or straggling grass. Mr. P. Cunningham remarks that the trees are nearly all evergreens, with fewer branches, and comparatively fewer leaves than European trees. Many shed their bark, and whilst the new has the appearance of a dead

tree pealed, the old bark is hanging in loose shreds and flakes, giving the whole much the character of an assemblage of dead trees. Dr. R. Brown attributes the monotonous aspect and want of lustre in the vegetation to the equal existence of the cutaneous glands, or stomata, on both surfaces of the leaf. Nor when vegetation has ceased does the decay of the decomposing parts impart the usual fertility, for Captain Sturt conceives that the decaying leaves and timber, instead of adding richness to the soil, actually preclude minor vegetation, and that plants seem to shun the spot where a tree has fallen and gone to decay. In a climate so arid, the seasons will assert a powerful influence over the vegetation, and as soon as the beneficial effects of the rains are felt, there is much gaiety and liveliness in the numerous curious and handsome flowers; but on their disappearance the vegetation soon becomes parched and uninteresting. The wood of the trees possesses to an important extent the property of incombustibility, which is supposed to be due to the presence of aluminous earth.

The botanist must take a closer inspection, and here finds a novelty and pleasure the more general observer is deprived of. The various species of eucalyptus, nearly a hundred in number, compose the chief bulk of the forest; it has been estimated at four-fifths. They are frequently trees of enormous dimensions, except within the tropics, where they are also fewer. Exocarpus cupressiformis is the commonest tree of New Holland, without the tropics. Casuarina has many species, which have the local name of oaks. Leguminosæ are very abundant, the decandrous papilionaceous kinds prevail, as pultenæa, gompholobium, and dillwynia; and the aphyllous species of acacia are almost peculiar. Compositæ are liberally represented by the tribe corymbiferæ, but very sparingly by the two

others. Orchidaceæ are very numerous as species, but not as individuals, always growing sparingly, and sometimes are extremely rare; those which are epiphytic cease at 34° S. latitude, and are more abundant in this region than the tropical. Palmæ extend to the same limit. Proteaceæ, myrtaceæ, and epacrideæ, abound in great numbers in peculiar genera, and intermingled with diosmeæ, goodenoviæ, myoporineæ, stylideæ, restiaceæ, tremandreæ, polygaleæ, and dilleniaceæ, impress very distinctive peculiarities. Cryptogamic plants are not so abundant as usual, owing to the dryness of the climate, the absence of large trees in many situations, and the deciduous bark. A tree-fern, dicksonia antarctica, extends through the region, even into Van Diemen's Land.

Relations.—It is not a little singular, that identical species of European plants appear here in greater numbers than in South Africa, or other intervening regions. Dr. Brown's experience renders his observations valuable. "In comparing very generally the flora of the principal parallel, (between 33° and 35° S. latitude) of Terra Australis, with that of South Africa, we find several natural families characteristic of the Australian vegetation, as proteaceæ, diosmeæ, restiaceæ, polygaleæ, and also butteneriaceæ, if hermannia and mahernia be considered as part of this order, existing, and in nearly equal abundance, at the Cape of Good Hope; others are replaced by analogous families, as epacrideæ by ericeæ; and some tribes, which form a considerable part of the Australian peculiarities, as dilleniaceæ, the leafless acaciæ, and eucalyptus, are entirely wanting in South Africa. On the other hand, several of the characteristic South African orders and extensive genera are nearly or entirely wanting in New Holland; thus, irideæ, mesembryanthemum, pelargonium, and oxalis, so abundant at the Cape of Good Hope, occur very sparingly in New Holland,

where the South African genera aloe, stapelia, cliffortia, penæa, and brunia, do not at all exist. Very few species are common to both countries, and of these, the only one which is at the same time peculiar to the southern hemisphere is osmunda barbara."*

XXII.—THE WEST AUSTRALIA REGION.

Extent.—The tropical features of New Holland are not fully developed on the north-west coast, which makes it necessary to extend the limits of this region in this direction. It will thus occupy the western portion of the continent from 123° E. long., and become mingled with the New South Wales Region on the south coast in the neighbourhood of the Morrumbidgee, the interior of the continent being unknown.

Physical Characters.—It is a feature in New Holland that the shores are invested by a broad belt of sandy soil, which gives them a very unprepossessing aspect to the stranger, and most of all to the settler. This is succeeded by grassy and thinly-wooded plains. Such is particularly the character of this region. At a little distance from the coast is a parallel, but irregular and broken, range of hills; and others detached are spread over the country. Basaltic rocks are not unfrequent, but that kind of sandstone known as ironstone, chiefly prevails, and forms the basis of the plains. Limestone is also not unusual. This surface generally is indifferently supplied with streams.

Climate.—Similar to that of New South Wales, but not so liable to extremes of temperature or to long droughts. At Perth the average temperature in Fe-

* Flinder's Voyages, Appendix, Vol. ii., p. 588.

bruary, at four P.M. was 84°, in August 63°, and at ten A M. respectively, 81° and 60°. The mean of these hours throughout the year are 72° 1 and 69° 5. January, February, and March, are the months of greatest heat and aridity.

Flora.—The plants of this coast are almost entirely distinct from those of the east coast, but with King George's Sound they are strikingly identical. This peculiarity, however, is chiefly confined to species. The most charactertstic plants are species of casuarina, callitris, zamia, exocarpus, xanthorrhœa, and kingia australis, and nutysia floribunda. Eucalyptus has few species, and angophora is not known. (*Brown in Journal Geographical Society.*) The northern limit of xanthorrhœa is at 28° S. lat. The vegetable productions, then, of this region are sufficiently peculiar, for whilst it fully retains Australian features, its closer forms are its own.

Relations.—South African ferns are more abundant than in any other portion of the continent, and this is conspicuous even in its proteaceæ. An European plant, arenaria marina, is met with.

XXIII.—THE VAN DIEMEN'S LAND REGION.

Extent.—The island so called, situated between 40° 42′ and 43° 43′ S. lat., and having an area of 17,192 square miles.

Physical Characters.—Van Diemen's Land has fewer of those extremes so frequent in the neighbouring continent. The surface is occupied by fertile plains, occasionally swelling into hill and dale, and sometimes raised into ranges of inconsiderable elevation. Ben Lomond, to the

north-west, attains 4,200 feet, and Mount Wellington, near Hobart Town in the south, about 3,700 feet. In the vicinity of the rivers are large plains with good soil, and covered only with an herbaceous vegetation. The whole island is available, and rarely unfit for cultivation.

Climate.—With our European notions of climate, this would be considered cold for the latitude. The seasons are more regular, and the distribution of heat and moisture more equable, than in New South Wales. The smaller range of temperature is attributable to its insular position, and the humidity to the prevalence of southerly winds.

Flora.—There is a freshness and variety about the vegetation denied to New Holland. Though possessing many of its distinctive groups, the species are to a great extent limited; its epacrideæ, proteaceæ, and myoporineæ have even peculiar genera. Eucalyptus, though with fewer species, attains here its greatest developement. Among its trees are podocarpus asplenifolius, dacrydium taxifolium, exocarpus cupressiformis, carpodontos lucida, atherosperma moschata, zieria arborescens, tasmannia australis, t. fragrans, with species of gaultheria, pomaderris, and fagus. Cryptogamic plants are numerous, and some are identical with the European. Dicksonia antarctica, an arborescent fern, is met with.

Relations.—The connexions of the vegetation are widely extended. With the more temperate parts of Europe there are many genera in common, as stellaria, linum, viola, clematis, anemone, ranunculus, veronica, drosera, geranium, polygonum, cardamine, and nasturtium. With the South Africa region more particularly, by pelargonium, elichrysum, and oxalis; with North America, by gaultheria and aster; and with the Malaisia region, by podocarpus.

XXIV.—THE NEW ZEALAND REGION.

Extent.—Two islands situated between 34° and 48° S. lat., and with an area of 62,160 square miles. The northern is the smaller, but possesses the greatest capabilities, and is called Eaheinomauwe. The southern is known as T'avai Poenammoo.

Physical Characters.—A lofty range of mountains, from 12,000 to 14,000 feet high, traverses both islands, their upper portions covered with eternal snows, and their lower clothed with noble forests, the trees of which are equally distinguished for their tall and stately growth, as for their great girth. The soil of the plains is plentiful in places, and yields a good return under cultivation.

Climate.—Temperate, but liable to fluctuations.

Flora.—Tropical vegetation still lingers in palms, arborescent ferns, and epiphytic orchidaceæ; the latter cease at 45° S. lat. Areca sapida reaches 34° S. lat. There is a curious mixture of its own peculiar forms with others common to both near and distant regions, as is evident in the genera dracæna, forstera, myoporum, melaleuca, avicennia, weinmannia, tetragonia, dicera, pimelea, epacris, phormium, knightia, plagianthus, cyathea, angiopteris, gleichenia, fuchsia, andromeda, oxalis, and mesembryanthemum. Palms, tree-ferns, and epiphytic orchidaceæ all occur farther south than in New Holland. The kawrie, yielding valuable masts and spars, is the dammara australis or agathis australis.

Relations.—The most interesting are with the Patagonia Region through fuchsia, mniarum, drymis, acæna, sisymbrium, and lepidium; and with the South Africa Region through gnaphalium, tetragonia, and oxalis.

There are also some other interesting affinities with South America. Agathis loranthifolia, a near ally of the kawrie, abounds in the Moluccas.

XXV.—THE SOUTH AFRICA REGION.

Extent.—Southern Africa beyond the tropic; Cape L'Agulhas, the extreme point, is in 34° 55′ S. L.

Physical Characters.—"The surface of this region is striking and peculiar, presenting three successive mountain ranges, running parallel to the coast and to each other. The first, called Lange Kloof, is between 20 and 60 miles from the ocean, the breadth of the intermediate plain being greatest in the west. The second chain, called the Zwaarte Berg, or Black Mountain, rises at an interval nearly similar behind the first, is considerably higher and more rugged, and consists often of double or triple ranges. Behind, at the distance of 80 or 100 miles, rises the Nieuweldts Gebirgte, the loftiest range in Southern Africa. The summits, to a great extent, are covered with snow; from which circumstance the eastern and most elevated part is called the Sneuwberg, or Snowy Mountains, whose highest pinnacles are not supposed to fall short of 10,000 feet. The plain nearest the sea is fertile, well watered, richly clothed with grass and trees, and enjoys a mild and agreeable climate. The plains between the successive ranges are elevated, and contain a large proportion of the species of arid desert called karroo. The southern plain in particular is almost entirely composed of the great karroo, 300 miles in length and nearly 100 in breadth, covered with a hard and impenetrable soil, almost unfit for any vegetation. Along the foot of the Sneuwberg, however,

there is a considerable tract, finely watered, and affording very rich pasturage. Beyond the mountains, the territory is for some space black and sterile; but it gradually improves till it opens into the extensive pastoral plain occupied by the Boshuanas. So far as this has been explored to the northward, it becomes always more fertile, though to the west there has been observed a desert of very great aridity. The eastern coast also consists chiefly of a fine pastoral plain, occupied by the various Caffre tribes, and broken by some chains of mountains, the direction of which has been very imperfectly explored."—(*Murray's Geography.*) The most fertile soil is found in the neighbourhood of the coasts, along the base of the Snowy Mountains, and in the vicinity of the rivers. Several rivers and streams traverse the country, becoming during the rains much swollen, and shrinking in the long and painful droughts to a small size, or to chains of muddy pools. Sandstone and granite greatly prevail in the mountain ranges, on which often repose clay-slate and greywache. "As far as is at present known, the whole of the table-land of Africa to the north of the Orange River is composed of limestone in horizontal strata, clay-slate, sandstone, and quartz rock, granite, greenstone, serpentine, and potstone." —(*Jameson in Murray's Geography.*) In some places the soil is very salt.

Climate.—Over such a diversified surface there will be much variety in the climate. The mean temperature and range are different in situations in the neighbourhood of each other, and the eastern coasts are colder than the western. Mr. Colebrook's observations give the mean of Cape Town 67° 3, and the extremes 96° and 45°, or fifty-one degrees. The mean of the coldest month is 57°, of the hottest 79°, least summer heat 77°, and the solar radiation is very considerable. Inland both the mean and

range are lower; at Stellenbosch the mean of one year's observations was 66° 3, range from 87° to 50°; at Zwartland the mean 66° 5, range from 85° to 54°. The year is divided into the cold or rainy season, which lasts from May to October, and the warm or dry season, from November to April. From the same we have some facts on the hygroscopic condition of the atmosphere obtained near False Bay from December to March. At sunrise the ordinary dryness was 6° or 7°, the extreme from 12° to 3°. The maximum at noon was 26°, the greatest range within the day 35°, mean dryness of the morning 7°, of the noon 14°, and further minimum dryness scarcely a fourth of the atmospheric capacity for moisture.

Flora.—This portion of Africa presents a good specimen of a particular variety of vegetation, where there is an intimate relation between the flora and external influencing circumstances, and a close adaptation of the organs of plants to the duties required of them. In many respects this is highly conspicuous; the leaves are often very small or minutely divided, and clothed with hairs, or tomentose, or lanuginose investments; many species are provided with fleshy succulent leaves, which do not part readily with their juices, and serve as so many magazines of nourishment, whilst the very numerous bulbous plants are eminently adapted to a climate which, for a long season, is extremely arid; at this time the bulbs retain their vitality without requiring any nourishment, and are ready to assume activity on the appearance of the rains. The want of moisture, equally with low temperature, as seen in northern regions, would seem productive of a low, stunted, bushy vegetation, and is also characterised by the frequency of spinous organs, the disagreeable effects of which are expressed in the quaint name of wait-a-bit, given to acacia detinens. The colours of the flowers are usually rich and

brilliant, the brightness of the solar rays, assisted by a clear atmosphere, having developed them in the most perfect manner. Pink, yellow, and white flowers greatly prevail, with a rare mixture of those tamer colours seen in a luxuriant vegetation under a moist atmosphere. Though the flowers are not conspicuous for their fragrance, this is frequent in the foliage; we observe this in various pelargonium cultivated with us, and on the spot in species of diosma, compositæ, and the numerous stapelia, if the carrion odour of the latter can be so called.

The mention of a beautiful provision of nature must not be omitted, particularly as it involves a departure from a general rule. The capsules of several species of mesembryanthemum refuse to open except when moistened by the rains, lest, opening in a dry season, they should shed their seeds on an unprepared soil.

The very numerous species which constitute the flora of South Africa belong, to a considerable extent, to genera which are peculiar; and even when it shares its natural families with other regions, its genera are rarely extended to them; as in proteaceæ, leguminosæ, irideæ, compositæ, rosaceæ, and cruciferæ. It is only in particular situations that forest exists, giving shelter to numerous savage buffaloes. The largest trees are ilex crocea, curtisia faginea, cunonia capensis, taxus elongata, laurus teterrima, olea capensis, tarchonanthus camphoratus, t. arboreus, brabejum stellatum, acacia vera, ekebergia capensis, and various proteaceæ, gardenia, and royena. We will glance hastily over the prevailing families and their more peculiar genera. *Proteaceæ* abounds in protea, serrularia, leucospermum, lorocephalus, spatalla, mimetes, and nivenia; *Leguminosæ* has liparia, lebeckia, aspalathus, borbonia, lessertia, psoralia, podalyria, and schotia; *Ericaceæ*, the very numerous and interesting group of erica, and the far

smaller genus blæria; *Diosmeæ* prevail extensively in diosma, agathosma, adenandra, and baryosma; *Asclepiadeæ*, the numerous and strange stapelia, with huernia and gomphocarpus; *Crassulaceæ*, a family with some kindred habits, is represented in crassula, rochea, leptas, and cotyledon; *Ficoideæ*, by the various mesembryanthemum, with tetragonia and hymenogyne; *Polygaleæ*, in polygala, muraltia, and mundia; *Compositæ* prevail extensively, and many are characterized by that peculiar texture of the flower belonging to everlastings. Most of the following genera are peculiar: chrysocoma, arctotis, othonna, osteospermum, tarchonanthus, sphnegyne, erichrysum, cacalia, pteronia, berckleya, and gazania; *Orchidaceæ* cannot be supposed to be abundant; disa and satyrium find convenient localities on the Table Mountain, and some of them are scarce; *Irideæ* abound in ixia, gladiolus, tritonia, watsonia, hesperantha, sparaxis, babiana, and trichonema; *Amaryllideæ* equally so in hæmanthus, strumaria, brunsvigia, nerine, cyrtanthus, and gethyllis. There are yet several important genera requiring notice: euphorbia has a group of species which simulate the habit of cacteæ, and supply their place; aloe has a great variety of species, and others are frequent, in oxalis, phyllica, restio, struthiola, cliffortia, roella, hypoxis, eucomis, massonia, lachenalia, and streletzia. Heliophila, a cruciferous genus, is monomic. Lobelia, cestrum, lyceum, chironia, and others prevail. Two families also claim to be regarded as monomic,—bruniaceæ and penæaceæ. Climbing plants are uncommon, as are also cryptogamic. Some ferns are found on the sides of the Table Mountain, the particular flora of which has other evidences of a moister atmosphere. The mass of the vegetation is to a great extent confined to the colony, and several of its more peculiar groups, ericaceæ, proteaceæ, diosmeæ, and restiaceæ, do not appear on the arid karroo,

which is occupied by gregarious species of lyceum, acacia, euphorbia, and mesembryanthemum. Some have a very limited range, and the species of stapelia abound more particularly on the arid sands of the west coast.

Relations.—The various relations of a region so complete as that of South Africa must be extremely interesting; and it seems probable that so rich a vegetation, with a liberal hand, gives more representatives to other regions than it receives from them. Passing over a more extensive view of its relations, we will confine our notice to groups having their chief existence elsewhere. A few of the genera of Europe, North America, and Siberia, have species here; the presence also of salix, bryonia, and viola, recalls a different latitude and climate. In common with the north-eastern portion of Africa, it has acacia vera, cucumis colocynthis, and a zizyphus; and has an affinity with New Holland in metrosideros angustifolia. Several introduced plants are becoming diffused, as solanum nigrum, sonchus oleraceus, and polygonum persicaria.

XXVI.—THE MOZAMBIQUE REGION.

Extent.—That portion of the east coast of Africa between 10° N. lat. and the south tropic in 23° 28′ has been so little visited, that nothing is known of its vegetation, except that it is clothed with rich forests, and has a climate in all respects tropical.

Physical Characters.—Spacious plains abound near the coast, traversed by considerable rivers, and liable to partial submersion.

Climate.—Tropical, moist, and frequently unhealthy, but well suited to the growth of the nutmeg, cinnamon,

and similar productions of a tropical climate in its excess.

Flora.—Further than that it abounds in luxuriant forest, and supplies us with Columba-root and a few other articles of commerce, little is known concerning it, and the native rulers are too jealous of foreigners to permit any examination of the interior of the country.

Relations.—It differs so entirely from the regions to the north and south, that the propriety of its separation from them seems undoubted.

XXVII.—THE MADAGASCAR REGION.

Extent.—The large and fruitful island of Madagascar, situated between 12° and 26° S. lat., and the far smaller islands of Bourbon, Mauritius, and the Séchelles.

Physical Characters.—In Madagascar, extensive fertile plains extend from the shores towards a lofty range of mountains in the interior. The soil is represented as rich and highly productive, and extensive marshy districts are occupied as rice-fields.

Climate.—Tropical, moist, and in some parts of Madagascar extremely fatal to human beings.

Flora.—Just enough of the productions of Madagascar are known to assure us they are peculiar, and to stimulate research. The vegetation is luxuriant, and varied with the usual aspect of the tropics. The natural family of chlenaceæ is confined to it; areanthes and other orchidaceæ abound. Tanghinia veneniflua, yielding a most energetic poison, and hydrogeton fenestralis, remarkable for the structure of its leaves, are both natives. Several species of the small family of homalineæ are found in the islands, and also the myrtaceous genus jossinia.

The *Mauritius* has rather an extensive and tolerably well-known flora, and with a fair proportion of peculiar species. Danais and chasalia are confined to it.

Bourbon closely resembles the Mauritius.

The *Séchelles* are chiefly remarkable for a double-fruited variety of cocos nucifera, which is produced on three of the islands.

Relations.—From its position, Madagascar would seem to belong to Africa, but such observations as have been instituted on its flora and that of the neighbouring coast, point out decidedly stronger affinities with India. Edwardsia is common both to New Zealand and the Mauritius.

XXVIII.—THE WEST AFRICA REGION.

Extent.—A considerable tract of country, inhabited by many populous nations, situated between the Great Sahara or central desert of Africa and the Atlantic Ocean, and Cape Blanco, in 20° 55, N. lat., and 23° 28, S. lat., or the south tropic.

Physical Characters.—In the neighbourhood of the coast the surface is composed chiefly of level plains, broken occasionally by ranges of low hills, and with chains of lofty mountains in the background, of primitive formation. Much of the soil is alluvial, and surprisingly productive; and the banks of the numerous rivers are low, and during a part of the year extensively overflowed by the rising of the waters. At the mouth of some of the rivers are large salt-water marshes, covered by mangrove and other congenial plants. But salt, so abundant in other parts of Africa, is here in the interior so scarce as to be greatly prized.

Climate.—Tropical, and generally moist; but in the vicinity of the desert partaking of its aridity.

Flora.—Over this extensive surface there is little variety in the vegetation; the same forms are continually repeated, and there is a scarcity of some of those elsewhere so abundant in the tropics. Palmæ have few species; elais guineensis, phœnix spinosa, raphia vinifera, and the cocoa-nut, are the chief. Musaceæ, scitamineæ, piperaceæ, are scarce. Yet there is a denseness and luxuriance in the vegetation hardly surpassed in any other part of the world. The forest is extensive and magnificent, the trees attaining a large size; and on the banks of the rivers which have been navigated some have been seen of enormous dimensions. Cinchonaceæ, leguminosæ, and malvaceæ abound; ficus, cassia, acacia, and euphorbia have many species. Some of the more conspicuous belong to bombax, adansonia, sterculia, cadaba, parkia, hoflandia, melhania, pentadesma, cratæva, capparis, grewia, pterocarpus, psychotria, bignonia, avicennia, anona, and pandanus candelabrum.

The Cape de Verd Islands have, perhaps, a less varied and vigorous vegetation than the coast.

St. Helena, situated in 16° S. lat., has the character of a very poor flora, but of which the members are nearly altogether peculiar. Of 61 species, two or three only have been noticed elsewhere. Ferns, grasses, compositæ, and the cocoa-nut and date-palm, are met with, but the climate is ungenial, and the sugar-cane scarcely thrives. The peak of Diana is elevated 2,692 feet.

Ascension Island is situated in 7° S. lat. The Green Mountain attains 2,818 feet. Some of the caves are verdant with ferns. Grasses are in proportion numerous, and portulacca oleracea, euphorbia origanoides, asclepias curassavica, convolvulus arenarius, and carex pedunculata, overrun the plains.

Relations.—Between the tropical portions of Asia, Africa, and America, many of the natural families are shared in common; thus we see combretaceæ, meliaceæ, ochnaceæ, sapindaceæ, terebintaceæ, anonaceæ, sapoteæ, and potaliaceæ, all essentially tropical groups, freely represented in each. Frequently the genera are in common, but beyond this the relations are feeble. Still some extensive families are only sparingly represented, as passifloreæ, melastomaceæ, myrtaceæ, and loranthaceæ. It is probable that when the vegetation of the base and flanks of the Cameroon Mountains shall be known, they will require a separate consideration. Their supposed elevation is 13,000 feet.

XXIX.—THE CANARY ISLANDS REGION.

Extent.—These islands are in the same parallel at the Great Sahara, being situated off that part of the African coast where that desert meets the ocean, and are thus situated, in a geographical position, between the Barbary Region and the West Africa Region. In addition to the islands more properly known as the Canaries, the region includes the fertile island of Madeira, with the almost desert Porto Santo and the Dezertos, and the Azores.

Physical Characters.—The islands of these groups may be regarded as so many mountains rising above the ocean to considerable elevations. Teneriffe attains 12,176 feet, and the highest part of Madeira, 6,233 feet. Their plains and valleys abound in a fertile soil, the productiveness of which is further insured by its volcanic origin, insular position, copious supply of moisture, and warm atmosphere. In some parts lava prevails so completely as to exclude vege-

tation, and those islands with an aspect towards the coast of Africa are materially affected by its arid breezes.

Climate.—The temperature is warm and even, but some parts are subject to considerable depression from sudden gusts, which sweep the cold air from the summits. The mean of Funchal, Madeira, is 65°, number of rainy days 73, and fall of rain 31 inches. At Santa Cruz, Teneriffe, the mean is 71°. The temperature given for the alpine regions of vegetation are calculated; those used by Spix and Von Martius are assumed from the calculations of Howard; we therefore pass them over till we possess strictly observed data.

Flora.—This must be regarded as an alpine region, and the different portions of its flora have been described by Humboldt, Von Buch, Von Martius, and Kuhl. There is, however, some discrepancy between their statements; for not only are the alpine regions of Teneriffe made to differ from those of Madeira, but also from the rest of the Canaries. In attempting to reduce them to mutual consistency we shall follow out the views we have previously expressed on this subject.*

Teneriffe has been ably examined by Humboldt, and his regions are nearly natural.

1. *The Region of Lowland Cultivation* extends to 1,800 feet. It is distinguished by the presence of a few tropical forms; dracæna draco, phœnix dactylifera, chamærops humilis, musa paradisaica, m. sapientum, arborescent euphorbias, and some species of mesembryanthemum from Africa, meet species of cactus from America.

2. *The Region of the Woods* extends to 7,200 feet. These woods are lofty and extensive, and comprise laurus indica, l. fœtens, l. nobilis, rhamnus glandulosa, erica

* London Journal of Botany for March, 1842.

arborea, erica texo, quercus canariensis. Ferns are numerous. A convenient subdivision may be established, since the pines occupy only the upper part of this region for the breadth of 25,000 feet; thus constituting — 1, the sub-region of laurels to 5,400 feet; 2, the sub-region of pines to 7,200 feet.

3. *The Region of Shrubs.* — Spartium nubigenum abounds, and not much else, for the surface is chiefly volcanic ashes.

4. *The Region of Grasses.* — Scrophularia glabrata, viola cheiranthifolia, and the cruciferous plants, cheiranthus longifolius, c. frutescens, c. scoparius, erysimum bicorne, crambe strigosa, c. lævigata, are met with.

5. *The Region of Cryptogamic Plants.* — It contains only urceolaria and other lichens.

Madeira, as the name implies, was formerly covered with woods, but the early cultivation of the sugar-cane, and subsequently of the vine, and still more recently the adoption of grazing, has produced a total change in the original features of the vegetation.

1. *The Region of Lowland Cultivation* extends to 2,000 feet. The agave, plantain, date, pomegranate, and fig all thrive well. Of sixty species found here, 36 are common to the north of Europe, 17 to southern Europe and northern Africa, and 7 peculiar to the Canary Region. Among them is scarcely a genus with more than one species.

2. *The Region of Woods* extends to 3,000 feet. The trees are not numerous; castanea vesca, pinus canariensis, laurus fætens, l. indica, clethra arborea. In thirty-two species, eight only are European, the remainder being peculiar. Here, therefore, the flora is more characteristic, and introduced plants have not attained this elevation.

3. *The Region of Shrubs* extends to the loftiest part of the island. Spartium scoparium, cytisus divaricatus, erica

scoparia, and vaccinium padifolium, abound. Grasses, belonging to cynosurus, aira, and agrostis, begin to appear on the higher stations.

In Madeira succulent plants are frequent; the trees have coriaceous leaves, and the northern families of amentaceæ, saxifrageæ, and caryophylleæ, are uncommon, as are the tropical families of euphorbiaceæ and malvaceæ. Of compositæ, the tribe of corymbiferæ is scarce, but cichoraceæ abundant.

The Azores are situated something to the north of the other islands. Like them they are volcanic, with bold scenery, scarped rocks, deep ravines, and a general elevation of the surface from 2,000 to 5,000 feet. The indigenous flora is scanty, but the climate is good, and highly suited to the growth of tropical and such other fruits as have been introduced. From their supposed comparatively recent origin, the early history and subsequent diffusion of vegetation might be satisfactorily studied here.

Relations.—In such a region a considerable change must have been produced by the extinction of native plants, and the introduction of others. Its affinities are more copious with Europe than south Africa. The species of cactus are regarded as instances of migration from America, and dracæna draco is supposed to have come originally from India. Of 62 plants collected at Teneriffe in Kotzebue's first voyage, 30 were peculiar to our region, 30 common with Europe, and 2 with Africa. Von Buch mentions 533 species as belonging to the Canaries, of which he considers 162 as introduced.

XXX.—THE BARBARY REGION.

Extent.—The northern part of Africa, embracing the states of Morocco, Algiers, Tunis, and Tripoli, is separated by the Great Sahara from the rest of the continent, and to the west is beaten by the waves of the Atlantic, whilst to the east it extends nearly to the delta of the Nile. The Atlas range of mountains forms an important portion of this region; and, when better known, will most probably contain its greatest peculiarities. There are also some other mountains of considerable elevation.

Physical Characters.—With much dry and barren land, there are also extensive districts of great fertility. The soil is generally sandy, but productive when supplied freely with moisture; and the neighbourhood of the Atlas mountains is indicated as possessing much that is rich and fertile. From the elevated lands numerous streams descend to the plains; those towards the north finding an outlet in the Mediterranean Sea, whilst those falling to the south are chiefly lost in the thirsty sands of the desert. The highest ascertained part of the Atlas range is 11,400 feet, is in the vicinity of Morocco, and clothed with perpetual snow. Salt marshes and lakes, and saline soils, are all of frequent occurrence.

Climate.—The heat is great, but not so oppressive as in Egypt or Arabia, in the same latitude. At Algiers the mean of the year is 70°, of the summer 80°2, and of the winter 61°4. Vegetation is in its greatest vigiour in autumn, after the rains. It is then that a crowd of herbaceous plants hasten to spread abroad their beauty, retiring rapidly as the moisture disappears; leaving a bushy vegetation to struggle with the parching atmosphere of the dry months.

Flora.—Only a partial examination has been made, and our chief acquaintance with the vegetation is due to M. Defontaines. It is owing to this that a very powerful connexion has been traced with the vegetable productions on the northern shores of the Mediterranean. When our knowledge of the interior is more complete, a greater proportion of peculiar forms will undoubtedly be discovered; at least such is a fair inference from what is observed elsewhere. Upwards of 2,000 species are known, and it has been remarked that, though a great number are peculiar, they belong to genera shared with Europe. In 344 woody kinds, about a hundred are peculiar. Those groups of plants which prefer a dry warm atmosphere, such as leguminosæ, malvaceæ, labiatæ, solaneæ, caryophylleæ, and certain compositæ, prevail. Among characterising genera may be mentioned rhus, zizyphus, vitex, viburnum, diospyros, pistacia, celtis, tamarix, juniperus, thuja, olea, adonis, verbascum, smilax, cercis, cistus, nerium, and agave. Pinus halepensis grows in large forests, and other species are frequent; a large surface is occupied by phœnix dactylifera. On the Atlas range are many quercus, and fagus, alnus, salix, with many herbaceous genera common to Europe.

Relations.—We separate this from the Nile region, on account of its alpine vegetation; and from the European regions, though undoubtedly some affinities are great, since the same combination of alpine and lowland vegetation does not occur in any of them. The alpine features more closely coincide with the Pyrenees, whilst those of the plains recall Italy and the south-east of Europe.

XXXI.—THE NILE REGION.

Extent.—The whole portion of country traversed by the Nile and its tributary branches. Towards its source the elevation of the surface compensates for the lower latitude, producing a milder climate and corresponding vegetation. It thus embraces a broad belt of country between the Red Sea and the Great Sahara, by which its isolation from other botanical regions is rendered nearly complete.

Physical Characters.—There is much diversity in the surface. The valley of Lower Egypt presents an uniform plain, almost without a hill, and subject to the periodical inundations of the Nile. Gradually a chain of bare and rugged mountains converge towards the river, leaving the intervening valley with only the breadth of a few miles. Upper Egypt assumes a bolder character; the banks of the Nile become rocky, and the inundations far less general. In Nubia, for this reason, the river is sometimes unapproachable, and a laboured irrigation is practised. Abyssinia is traversed by piles of mountain masses of extreme barrenness, and with intervening valleys, whose rich and productive soil is some compensation for their sterility. There is here a general elevation of the surface, and some of the mountains attain a great height. Egypt has been justly considered a granary with almost an unfailing supply; a productiveness which is dependent more on the overflowings of the Nile, than on any inherent richness of its somewhat sandy soil.

Climate.—Few regions would, perhaps, supply us with more interesting sources of the adaptation of the vegetation to the climate, if we were furnished with the necessary information. The temperature is warm; that of Lower Egypt particularly so, the mean summer heat of Cairo

being 92°. Rain is scarce; the dews, however, are heavy. Rain is more frequent about the Delta, and in the vicinity of the coast, than elsewhere. Thunder and lightning are even more uncommon than rain. The seasons are not very strongly marked, and run imperceptibly and rapidly into each other. Summer commences in June, and lasts till September. Autumn succeeds. The cold season begins in December, and lasts two months; and in February spring makes its appearance. Harvest succeeds in seven or eight weeks to the sowing; and the trees lose their leaves in the cold seasons, and are rapidly replaced by new. The inundations of the Nile, to which Egypt owes its vast fertility, are due to the autumnal rains of Abyssinia. Their effects are visible in the first week of July, when the river begins to swell; and, continuing to increase, has reached half its augmentation in August, and its greatest in the latter days of September. For two weeks it continues stationary, till on the 10th of November it has fallen one-half, and afterwards continues to decrease till the 16th of May, when it has reached its lowest.

Flora.—For three months the vegetation of Egypt is bathed in the overflowing waters of the Nile. As these subside a rapid vegetation ensues, the period of fructification is hastened and has passed away, and during the remainder of the year a parching aridity prevails. The superior luxuriance belonging to the former would be greatly misplaced in the latter; and, regarding the character of the vegetation, that particular variety has been dispensed to it which is congenial to the dry seasons, and will survive the inundation. It is not be expected that the flora will be numerous; and the aspect of the country is uniform and tame, being only relieved by some accidental trees of mimosa, zizyphus, phœnix dactylifera, and cucifera thebaica. Abyssinia is more fruitful, and contains many

spots of rich variety, and patches of fine forest. In accordance with these views, succulent plants are common; the leaves are those suited to a dry atmosphere, and spinous organs are much developed. It has been deemed singular that fungi should be entirely wanting in a soil for a certain period saturated with moisture, and apparently suited to their ephemeral existence. In some barren spots, beyond the reach of the inundation, certain plants have established themselves, and drag on a starved and stunted existence. The valley of Lower Egypt is not likely to present a very perfect specimen of an indigenous flora, having been under the closest cultivation for many ages; and it is probable that its alluvial soil has been the gradual deposit of the Nile, and that it has received its vegetation from Abyssinia and elsewhere. We shall, therefore, direct our attention chiefly to the former.

Some insight into the flora of Abyssinia has been obtained, particularly by Salt and Caillaud, who made collections. Many of its species are found to be peculiar, and to bear a larger proportion to the entire vegetation. Leguminosæ are very abundant through acacia, cassia, mimosa, pterolobium, erythrina, alhagi, desmanthus, and bauhinia. Other conspicuous genera are euphorbia, avicennia, juniperus, tamarix, zygophyllum, fagonia, polymnia, œrua, brucea, balsamodendron, cordia, and pistacia. Coffea arabica is indigenous, and fresnella fontanesii forms thick groves on some of the hills. Gramineæ are numerous, and several kinds of holcus, sorghum, poa, and andropogon, are cultivated. In those frequent situations, where neutral salts are mixed with the soil, are salsola, salicornia, traganum, and calligonum. The bed of the Nile is often closely set with sedges and flags. Papyrus antiquorum is equally found here and in the lakes of Abyssinia. Nelumbium speciosum has disappeared; yet still

the rivers of India and China are enlivened by its fine red flowers. The white-flowered nymphæa lotus abounds; and n. cærulea is sometimes seen. Arum colocasia is cultivated for food.

The vast sea of land of the Great Sahara is an effectual barrier to the extension of the flora of this region, in the direction over which it prevails. It consists of a low flat plain, with the surface covered with white and grey quartz, and becoming more shingly towards the east, or in the direction of the prevailing wind. It is towards its eastern part that the oases chiefly exist, affording a grateful resting-place to the traveller, occupied by a rather numerous population, and having a lively vegetation. The dreariness of the surrounding waste is here replaced by groves of date-palm. Acacia vera and other species shade the gushing streams, and tufts of grasses vary the surface.

Relations.—Many of the plants frequent on the shores of the Mediterranean appear in Lower Egypt; and some of those of Arabia cross the Red Sea to Nubia and Abyssinia. The most interesting relation, however, is with the South Africa Region through several species of mesembryanthemum, pelargonium abyssinicum, protea abyssinica, hagenia abyssinica, brunia ciliata, albuca abyssinica, and geissorhiza abyssinica. Adansonia digitata of the west coast re-appears, and the trunk is applied to entombing the dead. A tropical character is displayed in some of the genera enumerated, and in musa ensete. Rosa abyssinica occurs in the valleys of that country.

XXXII. THE ASIA MINOR REGION.

Extent.—Let us suppose ourselves stationed at the head of the Persian Gulf, and then project lines to the

west and north in the direction of the latitude and longitude. These, with the Caspian Sea, the range of Caucasus, the Black Sea, and the Mediterranean, will enclose an interesting portion of country, watered by the Euphrates and other considerable rivers, and comprising Syria, Palestine, the rich provinces of Turkey in Asia, Bagdad, and a portion of Persia.

Physical Characters.—The aspect and general features are variable. In some places it would be difficult to exceed the dreary barrenness and unproductive nature of the surface, resisting with complete success any invasion from vegetation. There are, however, others, and they are numerous, where the verdure and fertility are of the most agreeable kind. In Asia Minor, between the ranges of hills, are often beautiful and extensive plains in full cultivation, and dotted by the villages of the inhabitants; the groups of cypress and the singular burying-grounds pointing out those of the Turks, whilst cultivation and its attendants indicate those of the more thrifty Albanians. These plains are always well watered by streams originating in the surrounding mountains, and their benefits are greatly extended by irrigation, which from the aridity of the soil seems indispensable.

Climate.—This is generally regarded as warm, but some parts, as Bagdad, are distinguished for their great heat, and the northern winds produce a rapid and important depression of temperature. The summer months are generally warm and very dry, and the atmosphere is serene and transparent. Rain is even scarce in some places.

Flora.—The vegetation of Asia Minor is eminently adapted to delight the traveller. He is not buried in a vast dark forest, where the view is most circumscribed, and without objects to engage attention. Forest trees are grouped together in the valleys and mountain sides, whilst

occasional open spaces are in the undisturbed possession of piles of rocks, or more profitably occupied in agriculture. Sometimes a waving line of brighter green points out the course of a river or mountain stream. The foliage is generally distinguished for its evergreen character, the dark sombre shade of its colour, and the leathery consistence of the leaves. The trees most prominent are quercus infectoria, platanus orientalis, pistacia terebinthus, p. lentiscus, and other species of these genera, pinus halepensis, abies orientalis, cupressus sempervirens, juniperus sabina, ceratonia siliqua, juglans regia, liquidambar imberbe, and others of acer, celtis, fraxinus, and celsia. Among the smaller vegetation, labiatæ are numerous, and have their chief station here. The nearly allied family scrophularineæ is also freely represented, and cucurbitaceæ and asphodeleæ are conspicuous for their numbers. In some parts are extensive tracts producing a great multitude of individuals of tamarix, acacia, glycirrhiza, and hedysarum alhagi. And in others of even a less favourable character are met with chenopodium, ruta, rumex, artemisia, centaurea, amarantus, cucumis, lyceum, solanum, mesembryanthemum, and asclepias syriaca; which last, though a pretty plant, has an extensive range, and is every where a weed. The vegetation of Mount Caucasus is particularly rich and fascinating, but it has a very European character.

Relations.—I regard this region as separable from the Danube Region, with which it has much in common, in the different aspects of the vegetation, and in the partial cessation, sometimes nearly complete, of several genera as populus, spiræa, cratægus, campanula, rhamnus, viola, &c., and of the group of umbelliferæ. With the China Region it has many interesting relations, and prunus armenaica, which is represented as covering the sides of Caucasus, is again seen in China; and with North America there are

several through æsculus, juglans, and liquidambar. Ulmus campestris is supposed to have been introduced to Palestine by the Crusaders.

XXXIII.—THE ARABIA REGION.

Extent.—The Arabian peninsula, and separated from the adjoining region by a line extending due west from the head of the Persian Gulf to the Mediterranean sea.

Physical Characters.—Arabia is little else than an extensive desert clothed with straggling thorny shrubs, and having some spots of redeeming fertility. Rocky cheerless mountains traverse it, occasionally sheltering within them small fertile valleys, called Wadis. About Yemen, the country is superior, and vegetation has some luxuriance, and is remarkable for its fragrant qualities.

Climate.—An excessive clearness and transparency prevail in the atmosphere from the scarcity of moisture. The skies are almost always cloudless; from June to September showers occasionally fall, but chiefly about Yemen or Arabia Felix. Hot winds, coming from Africa, sometimes sweep its western shores.

Flora.—Arabia, famed for its spices, derives its reputation more probably from being a country of transit, than as their source. Still it has contributed its share, and even the general character of the shrubs is aromatic. Moving eastward, we meet in this region several new forms, reminding us strongly of Asiatic vegetation. Where forest exists, numerous species of ficus enter largely into it, mingled with sterculia platinifolia, tomex glabra, grewia, populifera, balsamodendron gileadense, b. opobalsamum, b. kataf, b. kafal, mærua uniflora, m. racemosa, cynan-

chum arboreum, celastrus edulis, c. parviflora, keura odorifera, and pandanus odoratissimus. Little woods of arborescent euphorbia occur. Cryptogamic plants, gramineæ, and cyperaceæ, are all scarce. Some of the bulbous plants of South Africa make their appearance, cucurbitaceæ are not uncommon, and succulent plants are also frequent. Coffea arabica is regarded as not indigenous, and the testimony of the Arabians themselves refers its origin to Abyssinia. Acacia arabica is native, and some active medicines are produced, as senna, aloes, myrrh, and olibanum.

Socotra is a mountainous island, consisting of granite, of indifferent fertility, nearly bare of trees, and distinguished for its aloes, dates, and dragon's blood.

Relations.—Its tropical forms are chiefly from India, but the most interesting affinities are with the South Africa Region through aloe, stapelia, mesembryanthemum, and hæmanthus. Several species are shared in common with the Nile Region.

XXXIV—THE TARTARY REGION.

Extent.—A broad irregular space, of peculiar aspect and fluctuating fertility, occupies the centre of Asia between the Altai and Himma-leh chains of mountains, including the states of Tartary, Thibet, and portions of Persia and Cabul.

Physical Characters.—Situated as it is between stupendous mountain chains, the greater part of the surface presents a considerable, but varying elevation, and is further diversified by being traversed by others of inferior grandeur. Aridity chiefly prevails, much of the soil being very sandy; large portions are sometimes so salt as not to yield the slightest vegetation, and the wind is said to

drive it on the bushes and cover them as with a hoar frost. Partial fertility is imparted by the streams, and more particularly by the rivulets occasioned by the rains.

Climate. — Extremes characterize the seasons; the summers are burning and arid, and the winters severe and nipping.

Flora.—Wherever there is shelter and some moisture, trees from the Asia Minor Region are met with, as pistacia lentiscus, p. terebinthus, pinus pinea, morus nigra, olea europea, and some oaks. Species of artemisia spread in crowds, impregnating the atmosphere with their peculiar aroma, and giving a bluish green tint to the steppes. Other characteristic species are spartium junceum, s. spinosum, statice tartarica, calligonum polygonoides, and others of selinum, centaurea, tamarix, salvia, verberis, ruta, lyceum, solanum, capparis, asclepias, astragalus, hedysarum, spiræa, rumex, and lithospermum. The fruits are those of warm temperate latitudes, and millet, barley, sorghum, amarantus, and paspalum are cultivated.

Relations.—The flora is poor, and so indifferently known, that this portion of its history remains in obscurity. The proportion of spinous plants is unusually great.

XXXV.—THE SIBERIA REGION.

Extent. — A continuous barrier, enclosing the vast steppes of Siberia, is formed by the Ural and Altai mountains, which forms its western and southern borders, and terminates at the sea of Okotsk in 55° north latitude. The steppes of Ischin, a portion of Tartary, is thus inclosed, and the region is limited to the north by the extent of the growth of trees somewhere about 65° north latitude.

The whole of the Altai range is comprehended, and constitutes an important portion.

Physical Characters.—The surface within the mountain ranges presents an extensive level plain, traversed by numerous large rivers with a general course to the Arctic Ocean, and therefore with an inclination towards the north. The aspect and nature of the surface varies; towards the north it is dreary and usually frozen; more to the south there are extensive districts of rich dark soil, and in the vicinity of the rivers are fine alluvial tracts. Small lakes and marshy patches abound, with their peculiar vegetation, and saline substances are occasionally largely mixed with the soil. The highest parts of the Altai range do not attain any considerable height.

Climate.—Siberia is not so bleak and inhospitable as has been generally represented, though, compared with similar parallels in Europe, or even in America, it must still be called inclement. Over much the soil is frozen even to June, but where the inhabitants can be drawn from the chase of the fur animals to the less exciting pursuits of agriculture, large and profitable crops of the northern cerealia are produced. The variety and beauty, with the occasional richness of the vegetation, is an unquestionable proof that the climate is not always severe.

Flora.—The clothing of vegetation which invests the surface, varies in different situations. In some are thick forests, in others extensive marshes; large tracts are sometimes covered with saline plants, or lastly, a luxuriant and pleasing vegetation prevails. The forest chiefly follows the direction of the rivers, and the pine prevails. Among the herbaceous vegetation, perennials are by far the most abundant, and though numerous species are identical with European, a great many are peculiar, and some still new to science. Nowhere, perhaps, do herbaceous

plants so truly luxuriate as in these latitudes, where they are in unrestricted possession of the rich soil. Their short existence through the summer months is compensated by a vigorous growth and obtrusive beauty. The predominating families are ranunculaceæ, cruciferæ, umbelliferæ, leguminosæ, saxifrageæ, and caryophylleæ. As the seasons advance, labiatæ, scrophularineæ, and borragineæ, contribute important members; whilst liliaceæ and irideæ are conspicuous among the spring vegetation. The individuality of the flora depends almost entirely on species, for the genera are extremely similar to those of Europe, and though the features of the vegetation are different, a catalogue would appear to show a close resembance. A few may be mentioned as to some extent distinctive, and which have usually several species; astragalus, hedysarum, caragana, pedicularis, pœonia, zygophyllum, phlomis, ephedra, and robinia. Ceratocarpus arenaria and diotis ceratoides are represented as covering large tracts; whilst the saline plants belong chiefly to polycnemum, atriplex, chenopodium, frankenia, tamarix, nitraria, and salicornia.

Pallas and Ledebour are almost our only authorities for Siberian vegetation. The latter has examined somewhat closely the flora of the Altai Mountains between 47° and 54° north latitude, and 73° and 87° east longitude. The influence of aspect was found to be important in favour of the south; from various observations, the limit of perpetual snow seems as high as 7,350 feet; in some places corn grew at 4,400 feet, and here also was the limit of habitations. At 4,900 feet the vegetation most resembles that of Europe. The highest limit of trees is 7,200 feet; pinus cembra, with a south aspect, attains 7,200 feet, and with a north aspect, 5,300 feet. Betula alba reaches 5,850 feet, and pinus siberica and abies communis grow together to the height of 5,800 feet, where they both cease. Ledebour mentions two

peculiarities in the vegetation; the nearly total absence of hard-wooded trees, such as those furnished by quercus, fagus, acer, tilia, carpinus, and fraxinus; and that many of the families which have numerous species are represented by few genera; thus, saussurea, serratula, and artemisia in compositæ, zygophyllum in rutaceæ, and astragalus, oxytropis, and phaca in leguminosæ monopolize the far greater part of the species in their respective families.

Relations.—When we reflect how much the continuity of the land has diffused the animal and vegetable productions of the northern part of Europe, Asia, and America, the Siberia Region must be allowed to have retained its entireness with great success. At the southern limits of the Altai range such a change occurs in the climate and physical characters as to be incompatible with a vegetation like that of Siberia. Towards Bering's Straits, though the interval is small, the difference between the two coasts is as marked as can be expected between neighbouring regions. Kamtschatka has received no important accessions from America, though the flora of the latter is represented in rhododendron, robinia, erigeron, claytonia, and trillium. This distinction is less evident on its west side, where the plants of Europe and Siberia intermingle. Through rheum and pœonia it claims an alliance with the more southern floral regions of Asia.

XXXVI.—THE JAPAN REGION.

Extent.—Balbi, in his Geographie, has indicated a Sinico-Japanese Region, but the lofty volcanic mountains, insular position, and rough climate of Japan, would seem to point to a peculiar vegetation, and one with predominating alpine features. The foundation of this region con-

sists of Niphon and Jesso, with the other islands known collectively as Japan. It also includes the long island of Saghalien, and a portion of the main of peculiar aspect and nearly covered with forest, situated between 55° north latitude and the river Hoang-ho in China. The peninsula of Correa is thus embraced, and the northern part of China, in which is situated the capital Peking, but a tract of country of great aridity and barrenness.

Physical Characters.—The aspect of the Japanese Islands is bold and rugged, and the mountains are elevated far above the line of perpetual snow. The connental portion, except to the south, is traversed by mountain chains.

Climate.—Severe for the latitude and prone to extremes. At Nangasaki, in 32° 45 north latitude, observations give the mean temperature as 68°, and the range in the year from upwards of a hundred degrees to below the freezing point.

Flora.—It is but indifferently known; the mass of the vegetation is temperate, but singularly mixed with tropical forms. Raphis flabelliformis and cycas revoluta mingle with species of acer, quercus, thuja, pinus, and juniperus. Thunberg collected near Naugasaki 755 phænogamous plants, which certainly bespeaks a flora rich in forms. Its bizarre character will be visible in pinus, abies, larix, tilia, salix, citrus, bumbusa, ficus, olea, mespilus, cydonia, prunus, salisburia, podocarpus, clerodendron, nerium, laurus, diospyros, paullinia, vitex, melia, broussonetia, camellia, illicium, and hydrangea. Like the China Region, the vegetation in connexion with the climate well deserves attentive study.

Relations.—In many respects they are close with China, and also abundant with Siberia through pinus cembra, the birch, the larch, and the willow, &c. The

affinities with the North American Regions are much stronger than happen in the China Region, through sambucus, æsculus, pavia, magnolia, vitis, bignonia, juglans, and rhododendron.

XXXVII.—THE CHINA REGION.

Extent.—A large portion of the east of Asia, comprising the vast empire of China, Correa, Japan, and the islands bordering the coast, presents a remarkable vegetation, influenced by some peculiarities of climate, and having many interesting relations with other and sometimes distant regions, from all which its isolation is complete. I regard it as conveniently divided into two regions; the China Region, and the Japan Region; the former entertaining copious relations with India, and the latter with Siberia. The China Region, the object of our present attention, does not embrace the whole of that empire, but that portion of it situated between the Hoang-ho, or great river, and the Gulf of Tonquin. Its western boundary is within a line stretching from the Gulf of Tonquin to the Himma-leh Mountains, and, continuing along the chain which separates Thibet from China, ceases at the Tartary Region. To the east it is bounded by the Pacific Ocean, but includes the islands of Formosa, Loo-Choo, and Hainan.

Physical Characters.—No country in the world presents such a forbidding aspect as China. The land on the southern shores is generally bold, and seems to be so swept by the periodical winds that vegetation will not thrive. A little fern and coarse grass alone resist them, with occasionally a few stunted bushes. In other places the shores are low, and flooded by the sea. Where, however, there are

sheltered valleys vegetation prospers, and is more distinguished for its variety than luxuriance.

The interior of the country, on the lowest estimate, supports a population of 230 to the square mile, the chief part of which has for ages been engaged in the great national pursuit of agriculture, and cannot have failed, in this long period, to have materially altered the face of the country, and to have driven the native flora to the mountains, and other places not favourable to cultivation. To this may also be attributed the scarcity of forest, but it must at the same time be remembered that this latitude elsewhere is not remarkable for this kind of vegetation. Particulars of the interior of China have been collected by the English and Dutch embassies, and in the writings of the Jesuit missionaries. The country is traversed by several mountain chains of no great elevation, pursuing various directions, and impressing a picturesque and even romantic aspect on much of the scenery. This is aided too by the scattered growth of trees, which are spread in open irregular clumps, and by the methodical and extreme cultivation of the plains. The prevailing mineral structures are granite, often traversed by veins of quartz or supporting blocks of it, coarse limestone, clay-slate, and sandstones. Bazaltic trap occurs in the island of Hong-kong. It was very generally observed that the rocks were in a state of rapid disintegration. The soil has an universal character throughout China, consisting of a loam of a red or ferruginous colour, sometimes clayey, and capable of being formed into bricks, which become blue after burning. The soil itself is sufficiently productive, and is diligently assisted by a persevering upturning and division of the lumps, the plentiful application of manure, and the most laboured irrigation. The mountains are rocky and barren, scattered with trees of quercus glauca or other species, laurus

camphora, or stillingia sebifera. The range separating the province of Canton is extensively wooded with pinus massoniana and p. lanceolata. Many bushes of melastoma, myrtus, rhus, camellia, eugenia, and chloranthus, abound in similar situations.

Climate.—Meteorological observations have been conducted at Canton through a series of years, which give some satisfactory mean results. June, July, and August, are the summer months, as with us, and the heat is intense. In December, January, and February, the weather is equally bleak and cold. The mean temperature is 70° 4′, and the range from 29° to 94°, or sixty-five degrees. It is in all respects a climate of extremes, for both the annual and diurnal range is great, and its peculiarities will be placed in the strongest light by a comparison with that of Calcutta, San Blas in Mexico, or other places in a nearly similar latitude. The influence of the sun's rays in the cold season is greatest, according to my observations, at one P. M., when their radiating power is 43° above the shade. The hygrometric state of the atmosphere does not appear so much influenced by the seasons as usual. Rain falls in all the months, but by far the greatest quantity in the summer. The mean of sixteen years observations is 70·6 inches. The amount varies greatly in different years, and also in different months. Thus ninety inches have been known, and in 1840 there only fell sixty-one inches. The range of the hygrometer is probably below the average, for in the dry season I never obtained a greater depression than 6°, and even then the dews were very heavy.

Flora.—The vegetation comprises great variety in species, and attractive kinds are more than usually abundant. It has been observed that, in relation to the space, forest is not frequent, but this is met by a great variety of low shrubby plants, the preponderance of which is character-

istic. Generally their foliage is evergreen, and with the customary rich deep green shades. Aromatic qualities also prevail among them. The flowers, though not of large size, are very frequently of rich deep colours, having a very showy appearance, and when they fade are succeeded by berries nearly as attractive from their varied colours as the flowers. The number of different kinds of berries yielded by the shrubs is really astonishing. One of the most striking features of the region is the mixed character of the vegetation, and it would perhaps be impossible to find it carried to a similar extent elsewhere. The violet is seen blooming under the shelter of the melastoma, the bamboo and the pine grow together on the hills, and the potato and sugar-cane are cultivated in the same field. A great number of natural families are represented, some of which are more prominent than others. Aurantiaceæ is particularly abundant; three species of orange are indigenous, and there are many varieties, and the fruit is always fine. The climate is undoubtedly eminently favourable to this group. Camellieæ is nearly limited here, and has several important species. Rhamneæ, connaraceæ, nepentheæ, leguminosæ, compositæ, myrtaceæ, sterculiaceæ, cinchonaceæ, and coniferæ, all deserve mention. There are some which appear unusually scarce, as tropical endogenæ, orchidaceæ, amygdaleæ, and the cryptogamic families generally, particularly fungi.

The arborescent vegetation is chiefly supplied by quercus, of which there are most probably many species. Pinus, also, with several species, one of which descends to 22° N. lat., thuja, cunninghamia, podocarpus, juniperus, acer, morus, sterculia, melia, ficus, magnolia, laurus, and bambusa. The shrubs are considerably more numerous: ilex, olea, rhododendron, rhus, rubus, azalea, rosa, spiræa, camellia, gardenia, canthium, itea, myrtus, eugenia, vibur-

num, photinia, raphiolepis, prinos, triphasia, murraya, glycosmis, pittosporum, melastoma, bauhinia, chloranthus, olea, jasminum, diospyros, and hibiscus. Among the plants of a more fugitive existence are malva tricuspidata, kalanchoe spathulata, clematis hedysarifolia, drosera loureirii, sida rhombifolia, indigofera hirsuta, crotalaria retusa, c. vachellii, abrus precatorius, mesembryanthemum cordifolium, torilis japonica, paratropia cantoniensis, with species of hypericum, polygonum, chenopodium, salvia, chrysanthemum, aster, gnaphalium, and grangea. Cyanus nelumbo and trapa bicornis are plentiful on the canals and quiet waters. Viscum ovalifolium is found in the neighbourhood of Canton: and another parasite, cassythis filiformis, festoons the shrubs with its sickly branchlets. The geographical range of the latter is extensive, stretching as it does from the Cape of Good Hope in 18°, E. long., to China, the Indian islands, and across the Pacific Ocean to 140°, W. long., or nearly two-thirds round the globe.

In a statistical view, the number of species in the flora appears to be small in proportion to the leading groups represented, as they stand in about the following numerical relations: families 5, genera 13, species 16, giving something more than three species to each family.

Some of the cultivated or more remarkable plants are worthy of notice, and the tea shrub is naturally the most prominent. The numerous varieties known in commerce are equally produceable from the two species, thea bohea and t. viridis, the difference depending on soil, culture, the age of the leaf, and the manufacture. It is a handsome shrub, with fragrant white (yellow, *Davis*) flowers, preferring the sides of the hills and a poor soil. Green tea is chiefly produced in Kiang-nan, between 29° and 31° N. lat.; black tea in Fohkien, between 27° and 28° N. lat. The favourite soil is a decomposed granite mixed with feltspar, and which

is used in the manufacture of the elegant porcelain in which the infusion is drank. One portion of the world, as the English and others, pronounce it tea; the other portion, as the Portuguese and Spaniards, cha. Both words are Chinese, but the former is the dialect of Amoy, and the latter of Canton. The range of the indigenous shrub is perhaps as far as 45° N. lat. The sugar-cane is cultivated to 30° N. lat.; but its productiveness is probably not great. The banana is abundant about Canton, but the fruit requires to be protected by a covering of the dry leaves—a practice I never observed elsewhere. It is far from attaining perfection, the saccharine qualities seeming to form after the fruit has been gathered, and when it is becoming almost rotten. Rice is most extensively cultivated throughout the empire, and is really the staff of life. The seeds of stillingia sebifera are surrounded by a substance resembling, and having the same use as, tallow. Ligustrum lucidum yields from its berries a wax. A branch of olea fragrans is the reward of literary attainments, Camellia oleifera and other species contain oil in their seeds, which is easily expressed, and is sold at Canton under the name of tea oil, for all common purposes. Æschynomene paludosa was for some time supposed to produce the rice paper of China; the proper plant, however, is still a desideratum. This plant is also a native of China, as well as India, where it is called shola, and has its uses. The fruits more particularly Chinese are the loquat, litchi, longan, flat peach, mandarin orange, red lime, and fingered shaddock.

Relations.—The entireness of its flora may be sought in the peculiarity of the vegetation when compared with the latitude, and in the sources of resemblance it has with distant regions, as with the Iroquois Region through magnolia, juglans, prinos, and ilex; with the California Region in general aspect and habit, and in the prevalence of rham-

neæ; and with several distant regions through pinus, quercus, acer, rhus, rhododendron, azalea, myrtus, lonicera, rubus, &c. Few of these plants connecting it elsewhere are shared with neighbouring regions, if we make some exception in favour of Japan: but of its more tropical species many occur equally in the various parts of India and the Malay islands. Through paliurus, diospyros, olea, and tamarix, we are reminded of Asia Minor. Species of euphorbia partially replace the cacteæ of the New World.

XXXVIII.—THE BIRMAH REGION.

Extent.—At present we separate this region rather because it has not the features of the neighbouring regions, than from any known peculiar characters of its own, since so little is known concerning it. It embraces a large portion of country extending south from the Himma-leh mountains, between the Ganges on one side, and the Gulf of Tonquin on the other, with the exception of the Malacca peninsula, which belongs to the Malaisia Region; including thus the kingdoms of Birmah, Siam, and Cochin China.

Physical Characters.—The interior is little known. The country would appear productive, and is watered by several large rivers.

Climate.—Tropical, but apparently without those extremes of temperature so frequent in the China Region.

Flora.—Botanists have hitherto made very slight inroads. Loureiro has given us a fragment of the vegetation of Cochin China. Aurantiaceæ seem to be nearly as frequent as in the China Region, and there are several of the most tropical plants in common, but a nearly complete absence of those of more temperate latitudes, which so abound

there. In Assam the tea plant has been found in abundance, and the leaves have been since manufactured and exported to England. Some of the species of Blume's Flora Javæ occur here, and perhaps also of other of the Malay islands.

Relations.—Unknown.

XXXIX.—THE MALAISIA REGION.

Extent.—The numerous islands of the Indian Ocean, of which Sumatra, Java, Borneo, Celebes, the Phillipines, Flores, and Timor, are the most extensive. The Moluccas are not included, as they belong to the New Guinea Region; the peninsula of Malacca, however, forms an important part of this region.

Physical Characters.—Bold scenery and lofty mountains are especially characteristic of these islands, and extensive traces of volcanic action are in many places apparent. They are generally distinguished for their rich soil and fertility, the latter due to a moist atmosphere, frequent heavy rains, and the constant influence of a hot sun. Though some of the mountains are extremely lofty, they rarely attain the elevation of perpetual snows.

Climate.—The equator traverses the region, and produces a difference in the distribution of the seasons in the islands somewhat removed from it. Those to the north have their wet seasons from May to September or October, being nearly the same as our summer. To the south, the rains commence in October and cease about April. At the equator, the distinction of these seasons is less decided, the different parts of the year being very similar. The range of temperature is very small in the year or during the day. The thermometer generally stands at 86° to 90°.

The rains are very heavy, and the air is usually laden with moisture.

Flora.—With few exceptions, the whole of the islands are covered with forest, which is particularly exposed to that rapid growth and decay consequent on a humid and warm atmosphere. It is rich in species, and distinguished as the source of some of those remarkable for their aromatic or luscious qualities, and which might be easily diffused throughout the region. In many respects they are the same as those of the Indian regions, with such differences as depend on climate. Leguminosæ, malvaceæ, and some others, are therefore not proportionately numerous.

Java is a rich and fruitful island. Its forests are filled with cinchonaceæ, which abound here in astonishing numbers, and which would seem to be the spot of greatest intensity of the family. Hydrocereæ, having only a solitary species, is confined to the island. The curious rafflesia and the famous antiaris toxicaria are indigenous. On the elevated lands of the interior quercus and other genera of a temperate climate are encountered.

Sumatra and *Malacca*, like Java, are covered with forests, supporting or sheltering a luxuriant vegetation, among which orchidaceæ, ferns, and climbers, are very numerous; and the dead wood is often invested with lichens of gloomy colours.

Celebes has an estimated superficies of 70,000 square miles. The forest vegetation is thinner than elsewhere, and the surface often very rocky. The neighbouring island of *Borneo*, however, has the usual vast compact forest, in which the dryobalanops camphora is conspicuous, and where at present it is confined.

Timor is distinguished for its sandalwood forests, but santalum is probably diffused over all the islands.

The Phillipines, though nominally belonging for so long

a time to the Spaniards, are really in possession of the natives, and sealed against Europeans; they are, therefore, little known. Some of the tropical plants of the China Region are found here, and the seasons are directly the reverse of those in the southern islands. From these and some other reasons, they may, perhaps, deserve to be considered as a distinct region.

Relations.—In the circumstances of the climate, and in some of the more prominent productions, there is a clear resemblance with some parts of the Oronoco Region. In the superior prevalence of cinchonaceæ in both, this is particularly manifest. With the Indian Regions there is much in common, and tectona grandis and other trees abound in the forest of Java, though dipterocarpeæ belongs chiefly to the islands.

XL.—THE HINDOSTAN REGION.

Extent.—Vast research has been already devoted to the immense flora of intertropical Asia, but the results rather make us acquainted with detached portions, than convey a general view of the whole. Thus there are extensive districts hitherto unexamined, and of which we consequently know nothing. A difficulty, therefore, exists, amounting in some cases to an impossibility, of defining its regional vegetation. However, there are important points of difference between the portion known as Hindostan and that comprehending Birmah and Cochin-China, and for the present we will regard the Ganges as an arbitrary line of distinction. To the north are the Himma-leh Mountains, and to the west the region probably crosses the Indus to the Solyman range.

Physical Characters.—Great diversity of character is

visible over this extensive surface. In the neighbourhood of the rivers, particularly that of the Ganges, the surface is an extensive alluvial plain, where a hillock would be a a novelty. In other parts, a number of secondary mountain chains traverse the country, and give rise to many rivers and streams which carry fertility through their course. These elevations are often extremely bold and rocky, and are sufficiently great to affect the vegetation and climate. On the whole the soil is fruitful, and in some places eminently productive; in others there are occasional sandy or rocky districts.

Climate.—The seasons are tropical, with perhaps a greater range of temperature than is customary for the latitude. At Calcutta the mean heat is 79° 4, and the temperature sometimes falls to 63°; at Madras the mean is 84° 4, and at Bombay 81° 9. The quantity of rain has been estimated at Calcutta to be 81 inches annually, and at Bombay 82 inches. In the Nhilgerries, where the elevation influences the climate, the mean of the year at Serloo, elevated 3,500 feet, is 70°; at Jackanary, 5,000 feet, 60°; and at Ootacamund, 8,500 feet, 56° 6. At the latter, the average fall of rain is about 64 inches.

Flora.—The magnificent vegetation of this region presents all that is rich and beautiful, and such as can be expected within the tropics. The extensive forests contain a great variety of trees, often of surpassing magnitude; and frequently the number of individuals is very great, as in the saul forests which skirt the base of the Himma-leh Mountains, and sometimes in the assemblage of palms in situations suited to their growth. We have only room to state, that the mass of the vegetation is derived from the following natural families: araliaceæ, nelumboneæ, capparideæ, flacourtianeæ, anonaceæ, myristiceæ, dilleniaceæ, laurineæ, menispermeæ, sterculiaceæ and dombeyaceæ,

sections of sterculiaceæ, moringeæ, elæocarpeæ, salicariæ, myrtaceæ, combretaceæ, santalaceæ, olacineæ, leguminosæ, urticeæ, artocarpeæ, euphorbiaceæ, celastrineæ, rhamneæ, sapindaceæ, vites, meliaceæ, cedreleæ, aurantiaceæ, connaraceæ, amyrideæ, burseraceæ, anacardiaceæ, ochnaceæ, balsamineæ, bignoniaceæ, piperaceæ, cucurbitaceæ, cinchonaceæ, loranthaceæ, loganiaceæ, asclepiadeæ, myrsineæ, cyrtandraceæ, begoniaceæ, cycadeæ, commelineæ, scitamineæ, smilaceæ, pandaneæ, and aroideæ. — (*Greville.*) Many of these families, however, are more copiously represented elsewhere, and some are but rarely seen. The families strictly confined to India are few, as memecyleæ, alangieæ, aquilarineæ, stilagineæ, and some of these even may be disputed.

Ceylon is estimated to contain 24,660 square miles, and its highest point attains 8,280 feet. The climate varies much in temperature and fall of rain in different parts. At Colombo the annual range is from 76° to 87°, and the fall of rain from 75 to 80 inches. The vegetation is similar to the continental, and the elevation of surface is friendly to the existence of a somewhat altered vegetation, mixed with a few genera of temperate latitudes.

Relations.—There is so much similarity in the controlling influences within the tropics of the different continents, that we are not surprised to find them approaching each other in the general characters of their vegetation. This is not only visible in the more bulky tropical families, as combretaceæ, melastomaceæ, piperaceæ, cinchonaceæ, and celastrineæ; but in the inconsiderable groups of pedalineæ, olacineæ, ochnaceæ, samydeæ, hippocrateaceæ, and homalineæ. In some instances, where the relations are less intimate, a compensation seems attempted, as in the presence of cyrtandraceæ for the gesnereæ of intertropical America. Whilst America presents some affinities with

New Holland, they are rarer in Asia, a circumstance perhaps due to geographical position. Several genera are shared with the China Region, the most remarkable being nepenthes. Cyrtandra is numerously represented in the Sandwich Islands.

XLI.—THE HIMMA-LEH REGION.

Extent.—This is probably the most interesting alpine region in the world, as some allowances are necessary for the charm with which Humboldt has invested the Andes. The novelty of his researches ensured an early and lasting impression on the minds of scientific men, and the wide reputation which ensued has so overshadowed the subject elsewhere, that all other mountain chains have been reduced to almost a secondary importance. The names of a few Englishmen have recently become associated with the examination of the natural features and productions of the Himma-leh Mountains, and the obscurity in which they were long buried has been considerably removed. This gigantic mass of mountains traverses a great portion of Asia from east to west in a somewhat devious line between 25° 20′ and 31° N. lat., and 75° and 95° E. long. In accordance with our views of the extent of an alpine flora, this region commences at the spot where the lowland cultivation ceases, and which, in different aspects and situations, varies, to an important extent, between 3,200 and 4,400 feet. Above this are the four permanent belts of an alpine flora. Von Buch is disposed to think there is room for another region towards the limit of vegetation, but I do not deem it advisable to distinguish further in the alpine regions.

Physical Characters.—The Himma-leh Mountains

are not a solitary chain, but are composed of many heaped against each other, of varied outline and elevation, and containing within them numerous defiles, valleys, plains, and every other disposition of surface liable to occur, and materially influencing the climate and vegetable productions. In many of these situations is collected a rich soil and all the appliances of great fertility. Their geological structure presents numerous rocks; approaching the chain from the south, sandstone first appears, distinctly stratified and containing strata of lignite; to these succeed various kinds of slaty rocks, imbedding quartz, limestone, and hornblende; lastly, gneiss appears in vast quantities, traversed by veins of granite, and imbedding garnets, schorl, hyacinth, and native gold. Animal remains occur in considerable quantities in some places, consisting of marine shells, fish, and the bones of animals. The breadth of the region varies between 250 and 350 miles, but the extent of surface geographically furnishes no correct estimate of the real superficies. The snow-line fluctuates according to the circumstances of the locality, but may be generally stated at from 14,000 to 16,000 feet, and is always higher on the northern flanks. Among the loftiest peaks are Javaher, attaining 25,800 feet; Dhawalagiri, 28,500 feet; and Chumularee, 29,000 feet; but vegetation has ceased long before.

Climate.—Whilst the region possesses the evenness of temperature, brilliancy of atmosphere, and other attendants of alpine situations, the climate is greatly affected by aspect, and the mean heat, range, and distribution of moisture differ on its northern and southern flanks.

Flora.—Nature has enriched this magnificent range of mountains with a varied and abundant vegetation. It is singular, that some of the genera that do not usually produce trees, have species here which attain a considerable

bulk, as juniperus, salix, ligustrum, rubus, and rhododendron. Though the range of its alpine regions varies considerably with aspect, the very brief notice we must here take of them will be found generally correct.

1. *The Region of Lowland Cultivation* extends to 3,200 or 4,400 feet. This correctly does not belong to the Himmaleh Region, but to that embracing the plains of Hindostan. Tropical productions prevail, as scitamineæ, epiphytic orchidaceæ, numerous tropical forest trees, the sugar-cane, pine-apple, mango, banana, and bamboo.

2. *The Region of Woods* extends to 11,000 feet. The vegetation is dense and luxuriant; the more conspicuous genera are laurus, quercus, pinus, ilex, magnolia, gordonia, prunus, pyrus, fraxinus, michelia, podocarpus, morus, ulmus, berberis, and populus.

3. *The Region of Shrubs* extends to 12 or 13,000 feet. Many of the genera of the last region enter this, but when of arborescent habit they universally become stunted and dwarf; salix, vaccinium, betula, juniperus, taxus, cupressus, stunted species of quercus and pinus, viburnum, lonicera, rhododendron, rubus, ribes, rosa, and ulex. Among herbaceous plants are potentilla, fragaria, gentiana, viola, saxifraga, salvia, dracocephalum, plectranthus, ranunculus, polyanthus, primula, antennaria, ageratum, sida, and geranium.

4. *The Region of Grasses* extends to 14,600 feet. It abounds in natural pasture land.

5. *The Region of Cryptogamic Plants* extends to the line of perpetual snow. Lichens and mosses prevail of identical genera, and also to a great extent, species, with the high latitudes of Europe.

Relations.—As we increase the height above the plains, the affinities with the neighbouring regions become less distinct, and others are established with distant latitudes

and other mountain ranges. They soon become very intimate with the Alps and Pyrenees, and even with the Altai and Andes. Genera common to both are represented by similar species, and sometimes one tree or shrub seems to occupy the place of another; thus, abies dumosa replaces the pinus pumila of Europe. There are a few species identical with Europe, as hedera helix, rosa canina, r. spinosissima, and salix babylonica. (Levant.) American affinities are recognized in magnolia, juglans, careya, ageratum, photinia, and osmorhiza.

XLII.—THE SPAIN REGION.

Extent.—Spain and Portugal, with so much of the mountain chains and southern side of the Pyrenees as is devoted to the cultivation of the plains; and the islands of Minorca, Majorca, and Loiça.

Physical Characters. — The European peninsula is traversed in all directions by numerous mountain ranges, often of the most forbidding sterility. Nor are the features of the intervening plains frequently much improved by any important accession to the vegetation. The most promising verdure will usually be found collected in the valleys, or along the courses of rivers and streams, and in some of the most fertile lower plains. The different provinces present some variety in this respect.

Climate. — The summers are warm, and the winters mild. Some parts are generally dry and severe throughout the year; but the northern parts, with a milder climate, are liable to much rain and heavy weather.

Flora.—The vegetation everywhere is characterized by the evergreen oaks; the habit, mode of growth, and foliage of which are peculiar. These consist of several species,

some of which are at present imperfectly defined. Among them quercus suber is distinguished as composing large woods; and q. ilex and q. tanzin are abundant. Entire woods of these trees are frequent in Aragon, Catalonia, the Castilles, Estremadura, Andalusia, Valencia, and Murcia. Quercus valentina of Cavanailles is seen in the eastern part of Valencia and other parts of the south. Q. australis of Link, a fine species, is associated with q. suber near Gibraltar. Q. fastigiata is found on the flanks of the Pyrenees. Of the deciduous kinds q. rubur is very abundant in the northern provinces, not existing in the central. Sometimes q. pubescens accompanies it. Q. coccifera prefers the south, where it abounds extensively, and extends as far north as the centre of Spain. Q. ægilops is met with in the Sierra Morena.

Captain Cook, in his Sketches in Spain, regards the vegetation as conveniently distributed into three divisions. The *first* division comprehends Galicia, Asturias, the Basque provinces, Upper Navarre, and the maritime parts of Old Castile. It is distinguished for the humidity of the atmosphere, equable temperature, its pastures, verdure, and luxuriant vegetation. It produces little or no oil, wine of an inferior quality, but much valuable timber. Quercus robur, q. ilex, menziesia daboeci, pteris aquilina, ulex stricta, u. europea, are chiefly characteristic. The *second* division includes the Castiles, Estremadura, Aragon, part of Catalonia, and the upper portions of Valencia, Murcia, and Andalusia. The climate is remarkable for its dryness. In some parts the olive is abundant; and Aragon is famous for its large pine forests. Quercus ilex, q. tauzin, q. prasina, and numerous cistus and helianthemum prevail. The *third* division occupies the shores of the Mediterranean, the western coast of Andalusia, and the valley of the Guadelquivir, as far as Cordova. The sum-

mers are hot and dry, and the winters mild. Syngenesious plants are abundant, as are also cistineæ and irideæ; and the sugar-cane, cotton, rice, sweet potato, lemon, orange, fig, and pomegranate, may be all seen.

It will be instructive to trace the vegetation south from the Bay of Biscay to Madrid, then south-east to the Mediterranean. In Asturias we are surrounded by quercus robur, castanea vesca, corylus avellana. The range of mountains may now be crossed, some parts of which about Puerto de Pajares attain from 8,000 to 9,000 feet. On the mountain sides here are fagus sylvatica and quercus prasina. About Valladolid is pinus pinea. The upper ranges of the Guadarrama are clothed with pinus sylvestris, and beneath it, at a somewhat less elevation, is quercus tauzin. Here, too, according to Captain Cook, is the southern boundary of the ash. After passing Madrid, pinus halepensis is seen mingled with p. pinaster; the former grows exclusively on the shore of the Mediterranean, and its northern European limit is 40° 20′. N. lat. at Sacedon. On the Sierra de Cuenca pinus sylvestris occurs for the last time, having hitherto tenaciously clothed every mountain summit, and p. maritima, and p. halepensis conduct us to Valencia.

Reseda is frequent, though it does not embrace the favourite of our gardens, which is a native of Egypt. Narcissus and similar plants are abundant in the spring vegetation, and among a multitude of others there are a few genera particularly deserving of mention as conspicuous in the flora; helianthemum, cistus, erica, teucrium, lavandula, ulex, spartium, ononis, rosmarinus, cerinthe, anchusa, echium, passerina, nepeta, delphinium, &c.

Of several families which have for a long time been regarded as densely clustered about the shores of the Mediterranean, cistineæ is found in the greatest intensity in

the Spain Region; labiatæ in the Asia Minor Region; caryophylleæ in the Danube Region, but are nearly equally numerous in Asia Minor, proportionately few in Spain, and many species are indigenous to the north of Europe and Siberia. Borragineæ are perhaps most numerous in the Danube Region, though very abundant in Asia Minor; less so more to the westward, but increase in the Canary Islands. And oleaceæ are most prevalent in the Italy Region, though fraxinus has most of its species in North America.

The Balearic Islands have a few peculiar plants. To *Minorca* are ascribed buxus balearica, arum crinitum, caprifolium implexum, ligusticum balearicum, rubia angustifolia; and to *Majorca* rubia lucida.

Relations.—Several tropical plants have migrated to this region, and imparted distinct features, such as chamærops humilis, phœnix dactylifera, agave americana, opuntia vulgaris, and other cacteæ. Its most decided peculiarity, as an European region, is derived from the presence of many African species. Both these features are more strongly impressed in the south, and the scanty vegetation about Gibraltar is characterized by genista unifolia, spartium junceum, teucrium valentinum, phlomis fruticosa, chamærops humilis, and opuntia vulgaris. A collection of phænogamous plants made by Von Martius at Algesiras contained 143 species belonging to the south of Europe, 60 to temperate Europe, and 17 to Africa; and of the whole number 58 were indigenous to Great Britain. A very interesting relation with the South Africa Region is displayed through erica, which has here several distinct species; and indeed the prevalence of the genus in a portion of Europe is remarkable when we reflect what a broad barrier intervenes, how truly a cape genus it is, and how very sparingly it is diffused elsewhere, even

when the climate and circumstances seem favourable, the whole of the two Americas not offering a single species. More relations with the same region may be traced through passerina and others.

XLIII.—THE ITALY REGION.

Extent.—Italy, to the south of the Alps, that portion of France south of the Cevennes, and Sicily, Malta, Corsica, and Sardinia.

Physical Characters.—Those who have entered Italy from the north by way of the Alps, have been always impressed by the sudden change and interesting character of the vegetation. The north of Italy is eminently fruitful, and in the Milanese the soil, aided by irrigation, yields four crops of grass in the year. This is the country of the Parmesan cheese. Prolonged irrigation destroys the grass, and a rotation of crops is conducted. The sluices are shut, and the soil subjected to courses of hemp, leguminous plants, oats, wheat, and maize, for five years. After this, grasses accumulate, and are assisted by irrigation, usually for fifteen years. The territory about Genoa is rocky and unproductive, and much of the south is in the same condition, and some parts almost too unhealthy to cultivate. In Sicily, the lava fields are planted with cactus, which after thirty years become fitted for cultivation.

Climate.—Generally the seasons are warm and even, and the temperature rarely below 32°, but in some places, as at Naples, they are liable to extremes. At Rome the mean temperature is 59° 5, of winter 45° 8, of summer 75° 2; at Toulon the mean is 62°, of winter 48° 4, of summer 74° 8, and at Hieres, in the neighbourhood, the orange ceases

to grow; at Palermo, in Sicily, the annual mean is 65°, and the range, in twenty years observations, from 105° to 34°, or seventy-one degrees; the number of rainy days is only 65, and the fall of rain 21·1 inches; the cotton plant, banana, and sugar-cane all repay cultivation. The amount of rain and rainy days varies somewhat; in Provence the number of rainy days is only 67, in Florence 103, fall of rain 31·6; in Rome, rainy days 117, fall of rain 39 inches, but at Tolluezzo in Friuli, and at Carfagnano in the Apennines, the amount is said to be respectively 82 and 92 inches. More rain falls to the west than to the east of the Apennines.

Flora.—As an European region, it is distinguished by the open character of its vegetation, the dry juiceless evergreen foliage, absence of real forest, and the mixture of tropical and sub-tropical forms. The olive, myrtle, fig, vine, and pomegranate, abound everywhere. Several of its grasses are peculiar, and some attain a large size, as arundo donax. In a climate like that of Italy, there will be a very considerable difference in the vegetation of the seasons, and the warm rains of spring are especially favourable to the presence of asphodeleæ and similar plants; ornithogalum, muscari, erythronium, ixia, bulbocodium, anemone, adonis, clematis, ranunculus, fedia, lotus, medicago, bellis, chrysanthemum, are now numerous; the more permanent vegetation is derived from certain species of quercus and pinus, acer, pseudo-platanus, diospyros lotus, paliurus australis, morus nigra, celtis australis, capparis spinosa, acanthus mollis, plumbago europea, erythrina corallodendron, smilax aspera, cassia italica, phyllyrea, hibiscus, erica, cistus, buxus, pistacia, ornus, numerous boragineæ, labiatæ, scrophularineæ, solaneæ, and malvaceæ.

Sicily has a flora extremely similar to Italy, and with

very few peculiarities. In the introduced plants there is a greater resemblance to the tropics.

Malta, from its situation, may be supposed to have more African plants than Sicily. Its total flora is about 200 species, nearly the whole of which it is likely have migrated here. Spix and Von Martius collected 150 kinds, of which 56 were common with Germany, 90 with the south of Europe, and only 4 with the neighbouring coast of Africa. It may have a few plants of its own, as fungus melitensis, yucca tenuifolia, and ricinus armatus.

Corsica offers a few peculiar plants, and the summits of the hills are covered with pinus laricio.

Sardinia has supplied us with common parsley, petro selinum sativum, but it is not limited to the island.

Relations.—In many respects this is a parallel region with the Spain Region, for tropical features show themselves in both, but in the latter are more mixed with African. Labiatæ, though numerous in both, are more abundant here. In the habit of the vegetation it corresponds in many respects with the Asia Minor, California, South Africa, and New South Wales Regions. The Cape of Good Hope genera of irideæ, gladiolus, moræa, trichonema, have each representatives here. Putoria calabrica, a cinchonaceous plant, is met with in the south.

XLIV.—THE DANUBE REGION.

Extent.—That portion of Europe to the South of the Carpathians, and between the Adriatic andBlack Seas, and consisting of Hungary, the Turkish provinces in Europe, and Greece, much of which is fertilized by the Danube and its tributaries. The southern extreme of Greece is in many respects very similar to Asia Minor.

Physical Characters.—No part of Europe is superior in the capabilities of the soil, yet none has been rendered so little available. From some of the productions it would appear more favourable than any other portion of this quarter of the world, for the growth of several of the plants of warm latitudes. The far greater part is still covered by forest, and there are vast marshes where rice is extensively cultivated.

Climate.—The summers are warm, and the winters not usually severe, but the temperature is liable to vicisitudes.

Flora.—The forest, which abounds over much of this region, is composed of a little variety in its trees; in Hungary, species of prunus enter largely into it, sometimes with multitudes of fraxinus rotundifolia; whole forests of cherries and apricots are seen in Wallachia, and the elevated lands sustain large numbers of firs, oaks, pines, and beeches; daphne cretica and spartium parviflorum characterize the shores of Gallipoli; the plum is everywhere cultivated in the greatest abundance, and is the source of a brandy called raky; rhus cotinus abounds in Sclavonia and the neighbouring provinces; and in the southern and south-eastern states are large groves of the olive.

Isatis tinctoria, or woad, exists in Hungary, and other species are indigenous; valeriana celtica, or spikenard, seems to prefer a certain elevation; daphne, nerium, clematis, capparis, arbutus, amygdalus, populus, acer, asparagus, orobanche, antirrhinum, astragalus, pyrus, cratægus, spiræa, gypsophila, thalictrum, helleborus, artemisia, chrysocoma, cnicus, carlina, kitaibelia, bubon, seseli, are all characteristic. Quercus racemosa is confined to the south, and the melon and the vine are largely cultivated in Hungary.

Relations. — In Spain the vegetation partakes of African features, and in this region of that of Central and

Western Asia. If it here wants the picturesque beauty of Italy, it is also without the dry sapless aspect of its trees; and the smiling circumscribed character of the vegetation is compensated by luxuriance and vigour. Those plants which like shelter, as certain ranunculaceæ and ferns, are more abundant, and for a similar reason crucifeæ are proportionately numerous. Mesembryanthemum has two or three species in Greece.

XLV.—THE ALPS REGION.

Extent.—The elevated sides of the mountain chains in the south of Europe, above the line of lowland cultivation, to their summits, or the limits of the vegetation. The principal are the Pyrenees, the different portions of the Alps, the Carpathians, the Apennines, and Mount Ætna.

Physical Characters.—It comprises an extent of rugged and bare mountains, but often sheltering within them rich moist valleys, and small verdant plains. Primitive rocks chiefly prevail, and sometimes with such steep scarped sides as to preclude the assemblage of soil and vegetation. In Mount Ætna, and in some parts of the Alps, there are large fields of lava, which, after a certain period, become clothed with plants.

Climate.—This will vary from temperate to frigid, according to the elevation; it is also liable to fluctuations, and to be disturbed by brisk winds and storms. The mean temperature of St. Gothard at 6,390 feet is 30° 4. On St. Bernard the fall of rain is 63 inches, which seems great for the latitude, since the mean of twenty places in the lower valleys of the Alps is 56· 5 inches. The mean temperature of Ætna, at the base, is 64°.

Flora.—The vegetable productions of higher latitudes gradually appear as the elevation is increased. At first are seen thick forests of their trees, till by degrees they become dwarf and stunted, and are then succeeded by shrubs; after these come certain herbaceous plants, with a large proportion of grasses, large spaces covered with lichens, and lastly perpetual snows. The flowers of this region are often distinguished for the pureness and brilliancy of their colours. The characteristic plants are chiefly derived from gentiana, campanula, phyteuma, cherleria, androsace, primula, aretia, soldanella, ramonda, helleborus, aconitum, saxifraga, pœonia, cytisus, and rhododendron.

The Pyrenees are situated between 42° and 43° N. latitude, and some of the highest peaks attain from ten to twelve thousand feet. The lower portions of both the north and south sides are covered with forests. The oaks on the north side, as quercus robur, q. tauzin, q. pubescens, q. fastigiata, but no evergreen species, these being confined to the southern flanks, and the genus ceases at 3,280 feet. Pines now prevail, pinus sylvestris being found on both sides, at its upper limits being mixed with p. uncinata, which soon after appears alone and closes in the trees at 7,800 feet. Rhododendron ferrugineum now grows in the valleys in vast quantities, with some northern shrubs. Some herbaceous species of cold climates with lichens soon after close in the vegetation among the perpetual snows, which commence at 8,950 feet. Abies communis and larix europea, have no existence here. The evergreen oaks cease at the village of Andorra. Several of the alpine parts of the Spain Region belong here, as the Sierra Nevada in Granada, Sierra de Estrella in Portugal, Sierra de Cuenca, heights of the Guadarrama, and others.

The Alps stretch across the south of Europe between 44° and 48° N. latitude, and present many greatly elevated peaks and ranges; Mont Blanc, the loftiest, attaining 15,730 feet. Their physical history and flora are scarcely of inferior interest to the Himma-leh mountains, but are far too extensive to be detailed here. The lowland cultivation ceases at about 2,000 feet, and is succeeded by forests of oak, chesnut, and pines, to 3,900 feet. Betula alba, rhododendron, and stunted spruce, reach 7,800 feet, salix herbacea extending something higher. The line of perpetual congelation is about 8,760 feet.

The Carpathian Mountains are situated in the east of Europe, between 45° and 50° N. lat. There are also some lofty peaks within this range, detached from the general chain. Mount Lomnitz attains 8,436 feet, but the average height is something below this. The lowland cultivation ceases at 1,500 feet. The region of woods succeeds to 4,600 feet, the lower part being chiefly occupied by the oak, birch, and particularly the fir. Next is the region of shrubs, and here also are a few stunted trees of pinus mughus, extending to 5,600 feet. And to these succeed a number of low alpine plants to 6,500 feet, or the summits of the mountains. When the elevation is greater, the surface is occupied by lichens to 8,000 feet, constituting the region of cryptogamic plants.

Mount Ætna is situated in 37° 43° N. lat., and has an elevation of 11,360 feet. Observers differ as to the lines of vegetation. The lowland cultivation of the vine and maize ceases at from 2,200 to 3,300 feet. The orange, lemon, and lime attain 1,900 feet, date 1,600, gossypium herbaceum 1,000, morus nigra 2,500, fig 2,200. The plants characteristic of the lava beds are andropogon hirtus, a. distachyos, lagurus ovatus, rumex scutatus, valeriana rubra, plumbago europea, thymus nepeta, satureja greca

ranunculus bullatus, capparis rupestris, scrophularia bicolor, heliotropium bocconi, mandragora autumnalis, senecio chrysanthemifolius, daphne gnidium, spartium infestum, solanum sodomæum, ricinus africanus, smilax aspera, euphorbia, linaria, &c. The region of woods extends to 6,500, the oak and chestnut ceasing at 4,350 feet, and pinus sylvestris at the limit of the region. The region of shrubs ceases at 8,125 feet, and contains bushes of juniperus, berberis, betula, and fagus. The region of grasses ceases at 9,750 feet, and of cryptogamic plants at 10,000 feet.

Relations.—Rhododendron, and some few others, carry our associations to the alpine regions of Asia and America, to lesser heights in China, and to some northern latitudes. Sempervivum abounds in species in the Canaries, yet on Ætna not a trace of it exists, but is replaced by sedum, which is equally numerous, but has no existence in the Canaries.

XLVI.—THE CENTRAL EUROPE REGION.

Extent.—That portion of the centre of Europe to the north of the southern chain of mountains is distinguished for a certain individuality in its vegetation, and the extensive cultivation of wheat. The southern limit is bounded by the Alps and the Carpathians to the Caspian Sea, and the Pyrenees and the Cevennes, thus excluding a portion of the south of France. To the north it includes Denmark, and a part of the south extremes of Sweden and Norway, and is separated from the Volga Region by a line commencing in the Baltic on the coast in 55° N. lat., and traversing the southern provinces of Russia to the sea of Azof. Its northern limit is in the vicinity of the

boundary of acer, pseudo-platanus, morus nigra, populus alba, p. nigra, pyrus malus, the vine and the chestnut; and the region generally may be regarded as that portion of Europe where wheat is most advantageously cultivated for food, to the north soon yielding to rye, and to the south to Indian corn and rice. Wheat is stated to be most profitably cultivated between 36° and 50° N. lat., and to cease entirely at 60° or 62°. The British islands complete the region.

Physical Characters.—According to Balbi, the surface of Europe presents several remarkable geographical features. Its centre consists of an extensive plain of considerable productiveness, and to the north in Russia it rises to a broad table-land of about 1,150 feet of elevation. Another important table-land occupies the centre of Spain, having an elevation of 2,300 feet, that of the Jura Alps attains from 1,750 to 3,850 feet, and another in Piedmont from 600 to 2,000 feet. But a far greater diversity is imparted by the several mountain chains of the Pyrenees, the Alps, the Carpathians, the Apennines, and the Dofrines, which considerably modify the climate and the character of the vegetation. Besides there are several valleys which serve to guide certain rivers to the ocean, and which are pre-eminent both for their beauty and fertility. Of these the most distinguished are the valleys of the Lower Danube, the Rhine, the Drave, and the Po. Formerly, by far the greater portion of the surface was covered with forest, much of which has been gradually removed by cultivation, but very extensive tracts in Russia and Poland are still in this state, and throughout Europe generally a good deal of forest still remains. On the whole, the soil is good and fruitful, but there are spots consisting of little else than rocks, or where the occasional invasion of the sea renders it unserviceable, or where bog, morass, or heath exists, to

the exclusion of cultivation, as in the countries south of the Baltic.

Climate.—Malte-Brun and Balbi assign to Europe three well-defined climates; the Atlantic distinguished for its even temperature, and its moisture; the climate of the north-west of Europe being one of extremes of temperature: and the climate of the south, which, with its higher temperature, holds a middle station between the two others. Aware, however, that this division very imperfectly expressed all the important features, a further seven-fold one was proposed. Europe is so situated, between extensive seas on one side and a large mass of land and range of mountains on the other, that it cannot fail to be greatly governed by their influence over climate, and to offer some variety. Compared with other climates of a similar latitude, it will be found to be mild, less exposed to vicissitudes, and that vegetation attains a higher northern station. Between the west and east portions there are certain differences. The mean heat may be nearly the same through the same parallel, but the distribution in the seasons will be different. On the west side, the climate being equable, the range throughout the year is not great, and the mean of the summer and winter months will not be in excess; the atmosphere is also moister, and the number of rainy days greater. On the east side, however, the mean of these two seasons is prone to extremes, and to take respectively higher and lower stations. Whatever differences occur in the mean heat of the year will be in favour of the eastern portions. The result of this on vegetation is, that plants which prefer a climate free from extremes, and that move with the mean temperature, will take a higher northern station on the eastern side, as is visible in some of the plants of Norway and Sweden, the apple for instance; and those which revel in a hot summer, and are indifferent to

the extremes of winter, will be found occupying a limit gradually extending towards the north-east.

In the Central Europe Region, the circumstances of the climate are less strongly marked. The mean varies from 48° to 54°, and the usual annual range from 28° to 83°. The atmosphere is often much loaded with moisture, and the rainy days are nearly half the total to the year, though the quantity of rain which falls does not exceed from 22 to 30 inches. The mean hydrometric state of the atmosphere is four or six degrees below the mean temperature. In a climate so clouded, the power of the sun's rays over vegetation must be supposed to fall far short of their effects in lower and more brilliant latitudes.

Flora.—The indigenous productions are those of a temperate latitude. The climate holding a middle station, the plants of the south wander here, and those of the north do not find it ungenial; it has thus a large proportion of species for the extent of surface, and the more important groups of plants are freely represented. The region will therefore display, with a number of species, also a number of genera and families, the proportions of the latter to the former bring greater than usual. In the forest trees, however, the number of species as compared with other regions is singularly small, and genera extensively represented elsewhere have here often only solitary species. Nearly all have deciduous leaves, and though grasses have not an important numerical relation to the flora, they flourish in great luxuriance. These trees often manifest a partiality to particular soils, and in the forest, which clothes a larger portion of Poland, the oak, yew, ash, poplar, chestnut, and willow, are found on the clayey soil, whilst the pine and the fir occupy exclusively the sandy soil. Inconspicuous flowers prevail greatly, as might be expected where amentaceous and coniferous plants are so numerous, but in other

regions it is not unusual to have an intermixture of attractive flowers even in the trees, such as is not seen here. The details of the region may be sought for in ranunculaceæ, cruciferæ, caryophylleæ, geraniaceæ, saxifrageæ, leguminosæ, particularly the section vicieæ, rosaceæ, stellatæ, compositæ, borragineæ, ericaceæ, gentianeæ, labiatæ, scrophularineæ, polygoneæ, chenopodeæ, the families of amentaceæ, orchidaceæ, junceæ, cyperaceæ, gramineæ, and a large proportion of the cryptogamic families.

Umbelliferæ have a slight preponderance over other regions, as will be seen in their distribution. The total number of species is 1,009, but the duplicate habitats are here included. In the Central Europe Region there are represented 172 species; Danube Region, 161; Italy Region, 152; Asia Minor Region, 90; Spain Region, 82; Barbary Region, 69; South Africa Region, 63; Iroquois Region, 61; Volga Region, 53; Siberia Region, 50; Chili and Peru Region, 45; New South Wales Region, 29; Paraguay Region, 19; Patagonia Region, 10; other regions, 216. They are here found to exist in far greater numbers in the northern hemisphere, and particularly in Europe. In the latter they are most densely assembled in the central, southern, and south-eastern portions, whence we may infer their partiality for a warm temperate climate, for warm summers and extremes in the seasons rather than the reverse, and lastly, for an atmosphere tolerably supplied with moisture. A few species cling to Western Europe along the shores of the Atlantic, and are not found in the eastern countries. Some have a partiality for elevated stations in the Pyrenees, Alps, Andes, and Mexican highlands, and the Asia Minor Region derives its species in great part from Caucasus.

France is chiefly included in this region; it has an area of 200,925 square miles, and 5,966 species; or, in the proportion of one species to about 34 square miles.

The British Isles are estimated to contain 110,181 square miles, and their total vegetation, omitting algæ and fungi, is composed of 2,393 species, or one to every 46 square miles. These are distributed among 939 genera and 112 families. The value of the genus, or its average proportion of species, is 3·7; of the family, or its proportion of genera, is 5·7; of the exogenous genus, 2·8; of the same family, 4·7; of the endogenous genus, 2·8; of the same family, 6·7; of the cryptogamic genus, 8·5: of the same family, 13. The flora has little to distinguish it from the continent of Europe.

Ireland has 682 exogenæ, 211 endogenæ, and 41 ferns. Some plants are found there not indigenous to Great Britain, but generally occurring to the south of Europe; as, arbutus unedo, menziesia polifolia, papaver nudicaule, sedum palustre, arenaria ciliata, saxifraga umbrosa, pinguicula grandiflora, trichomanes brevisetum, hookeria lætevirens, and h. splanchnoides. The two last are quite peculiar.

Relations.—Besides the close relations to neighbouring regions, some interesting affinities exist with the distant Patagonia and Van Diemen's Land Regions. Compared with its American parallel, the Iroquois Region, it fails greatly in variety, and particularly in the forest trees.

XLVII. THE VOLGA REGION.

Extent.—Russia, to the west of the Ural Mountains, and to the north of a line commencing at the fifty-fifth degree of latitude on the Baltic, and extending to the Sea of Azof; with the whole of Norway and Sweden, with

the exception of a small portion of their southern extremes.

Physical Characters.—Russia consists chiefly of an extensive plain of inconsiderable elevation, and dotted with numerous lakes and marshes, and Norway and Sweden are intersected by lofty mountains.

Climate.—To the eastward the climate is one of extremes, the summers being hot and the winters long and severe. On some days the temperature is higher than is usual many degrees to the south. The western countries have a more even climate, but still a rigorous one.

Flora.—The extensive and often magnificent forest, which covers nearly the whole of this region, is composed chiefly of pinus sylvestris, mingled with abies picea, and a. communis; and pinus cembra is met with towards the Ural Mountains. Though the species of pine are fewer here than in the south, the trees are of far finer growth; a circumstance that occurs also with the eucalyptus in Van Diemen's Land, where, though there are fewer species, the trees grow much larger. Sheltered by the forest, a dense undergrowth flourishes, of species of vaccinium, andromeda, empetrum, rubus, salix, betula, and arctostaphylos. Coniferæ, amentaceæ, saxifrageæ, cruciferæ, and ranunculaceæ, are particularly prominent, and some members of umbelliferæ, caryophylleæ, and borragineæ, are mixed with the vegetation, but are rapidly disappearing. An English botanist visiting this region will find most of the northern plants of his own island, but will perhaps be more surprised to see what an altered character a vegetation of similar species assumes here; for he will find many plants very common, which were rare at home, and others before regarded as common weeds are here prized. Senecio jocobæa, so frequent a nuisance in our meadows, is in Norway an object of diligent search.

Several important plants have their northern limits in

this region. Quercus robur ceases at 61°, fraxinus excelsior 60°, fagus sylvatica 60°, prunus cerasus 57°—60°, tilia intermedia 63°, abies communis 67°, populus alba and p. nigra 56°, pinus sylvestris 70°; the ash, alder, aspen, and juniper, in Norway, reach the arctic circle, or 67°, but cease near the Urals at 60°.

Alpine vegetation can scarcely be supposed to exist in a region which possesses so many of its characters, and any attempts to give it prominence will be attended with very feeble results. In Lapland, between 66° and 68°, according to the statements of Wahlenberg, the *Region of Trees* attains 1,800 feet; the *Region of Shrubs* succeeds to 2,500 feet, and is closed in by lichens and perpetual snow at 3,300 feet. In Finmark, according to Von Buch, at 70°, pinus sylvestris grows to 730 feet; betula, larix, and vaccinium, to 3,100 feet; then cryptogamic vegetation and perpetual snow at 3,300 feet.

Relations.—The parallel regions in America are filled with forests of noble trees of abies instead of pinus, mixed with cupressus thyoides, and occasionally a pine, cratægus, or fraxinus; besides this there is much similarity in the vegetation.

XLVIII.—THE OCEAN REGION.

Extent.—The shores and shoal waters of the ocean through all latitudes, from high-water mark to a depth at present uncertain, but which most probably is inconsiderable.

Physical Characters.—The medium in which marine plants live may, in several ways, affect the functions of those which select it for their habitation. The influence of the atmosphere is nearly excluded; and light, even at

small depths, is greatly obstructed. The saline constituents must be regarded as essential to their well being, though I have seen a fucus and a potamogeton growing together in water of a very slight degree of saltness. In many cases they evidently display a selection as to their place of attachment, and usually prefer mud or soft rocks to harder substances. They appear particularly scarce in coral islands, perhaps because the coral animal feeds on them.

Climate.—The seasons and temperature have a decided influence. In the summer months this flora is in great vigour, and when a season occurs eminently favourable to vegetation, it is proportionately affected. From their geographical distribution it may be inferred that these plants are sensible of small variations in the habitual temperature. Within the tropics those living in shoal waters are surrounded by a temperature varying from 74° to 86°. At greater depths the temperature gradually and evenly descends. A decrease, however, does not always happen. In 25° N. lat., when the air was 67° and the surface of the sea 69°, the temperature at 35 feet was 73°. The temperature at the surface will generally be found to fluctuate about the mean of the latitude, but is liable to be disturbed by currents, as is the case with the gulf stream, which so modifies and warms the climate of the Bermudas. In high latitudes the surface may be sometimes below the mean temperature, and an increase occur for certain depths, but this will rarely exceed 42° or 44°.

Flora.—Notwithstanding the uniformity of the ocean, the facilities of diffusion, and simple organization of the vegetable beings which inhabit it, they will be found often remarkably circumscribed in their limits of growth. The same laws prevail as on the land, that there shall be everywhere variety, and that under similar circumstances in widely separated localities there shall be close relations.

Looking over, then, this extensive region, the different deep inlets, gulfs, and seas, will each be found to have their own peculiar kinds, and sometimes in such numbers as almost to justify their exaltation into separate regions. It is said that the species found in the Red Sea are almost entirely different from those of the coast of Syria, though separated by so small a portion of land. In our own island rhodomenia cristata and odonthalia dentata are confined to the northern shores; and fucus tuberculatus, laurencia tenuissima, rhodomenia jubata, rhodomela pinastroides, iridæa ensiformis, and others, to the southern.

The flora of this region is entirely derived from the natural family of algæ, but does not comprehend all its species, since many prefer fresh waters. Lamouroux has calculated that the total number of species may reach 5,000, or even 6,000. Fucus and laminaria exist in enormous beds in the high latitudes of both hemispheres. Several species of sargassum replace the former within the tropics, where they are often densely crowded on the surface, and generally in an active state of vegetation. Tamnophera, caulerpa, gelidium, amansia, and dictyoteæ are chiefly tropical. Codium tomentosum is found in nearly all seas throughout the world. Macrocystis belongs to the southern hemisphere from the equator to 45° S. lat, and durvillea and lessonia are likewise limited to this part of the world. Thaumasia ovalis, a remarkable plant, is found only at Ceylon. Cystoseira has several species on our own coasts, and others abound in the northern hemisphere, but a peculiar group is met with in New Holland, where, Greville remarks, it is as peculiar as the aphyllous acaciæ are on the land.

Relations.—Between the terrestrial and marine vegetation the link is perfect and complete. Of the latter, the mass unquestionably find the waters of the ocean essential

to their existence. Some, however, of closely allied organization prefer fresh or sweet waters; and there are a few which live indifferently in both. With lichens, hepaticæ, and fungi, they have much structural resemblance, and like them prefer cold climates, where they all flourish in greater numbers and luxuriance. Moisture also is necessary to the existence of them all, and the selection of certain lichens and fungi of old walls may be due to the saline substances to be found there, and which the marine plants receive from the ocean.

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